

FIG. 1

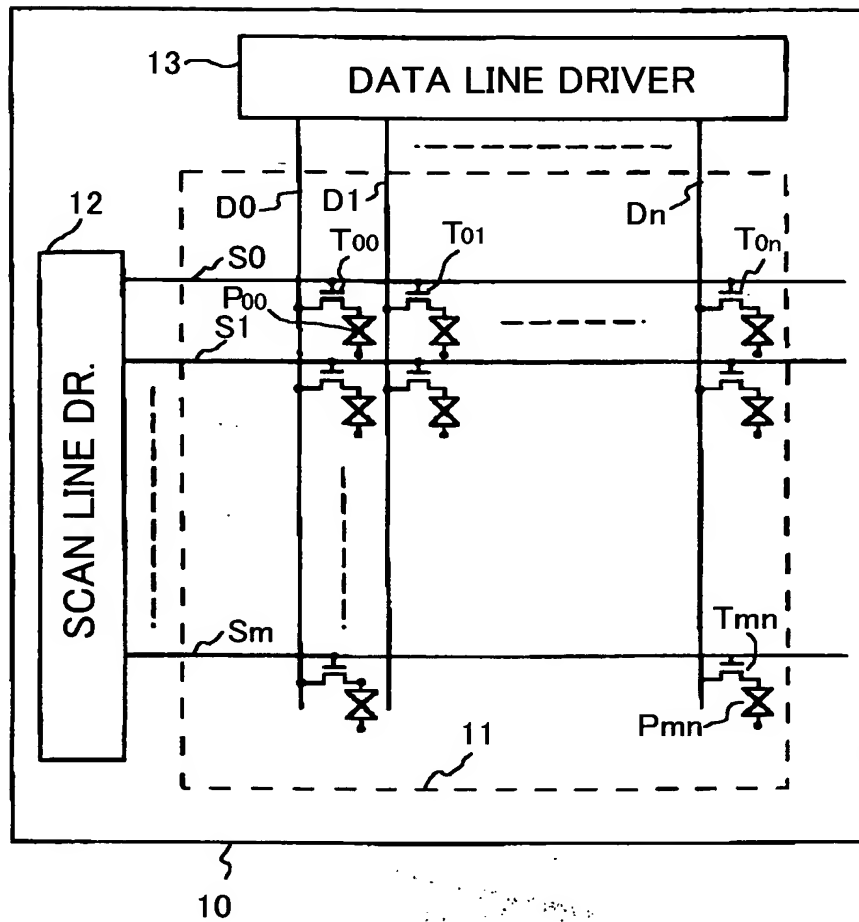


FIG. 2

FIG. 3A

Resist deposition  
 Pre-baking

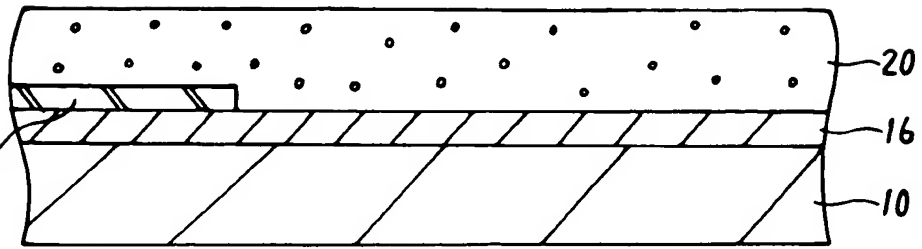


FIG. 3B

Exposure &  
 Development  
 for contact hole,  
 Post-baking

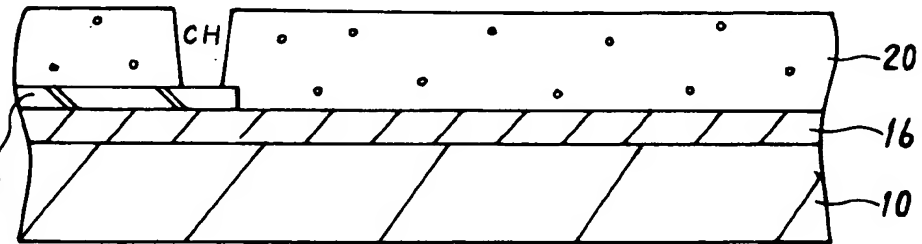


FIG. 3C

DUV irradiation

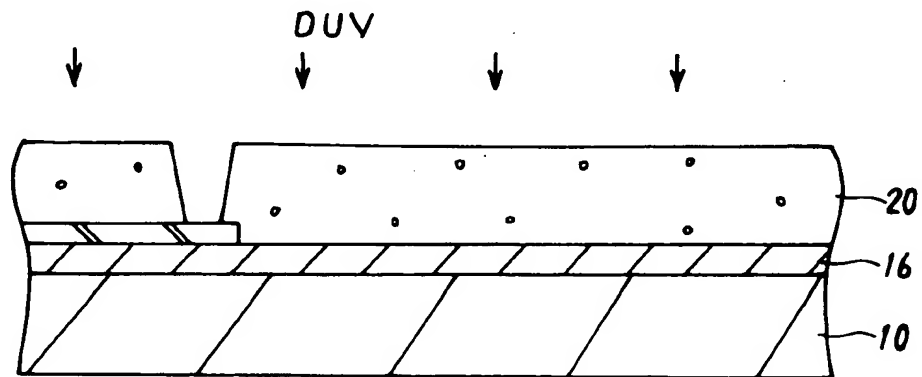
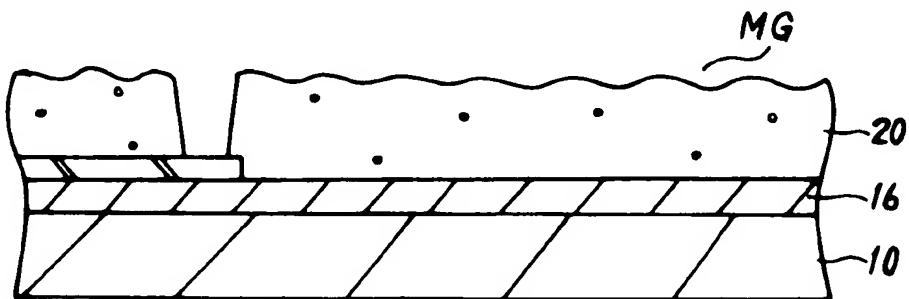


FIG. 3D

Final baking



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FIG. 4

Thickness  $2 \mu\text{m}$

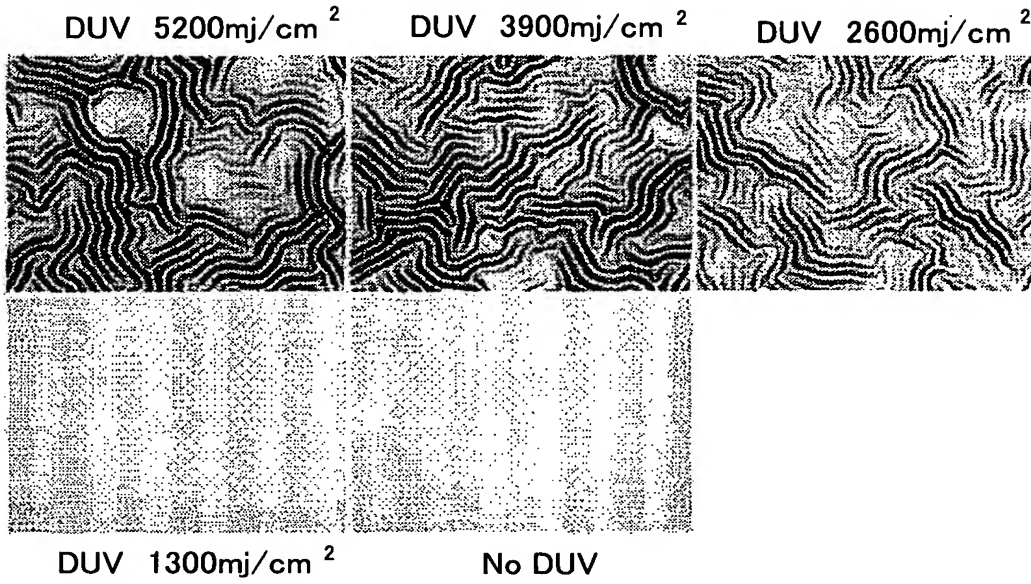
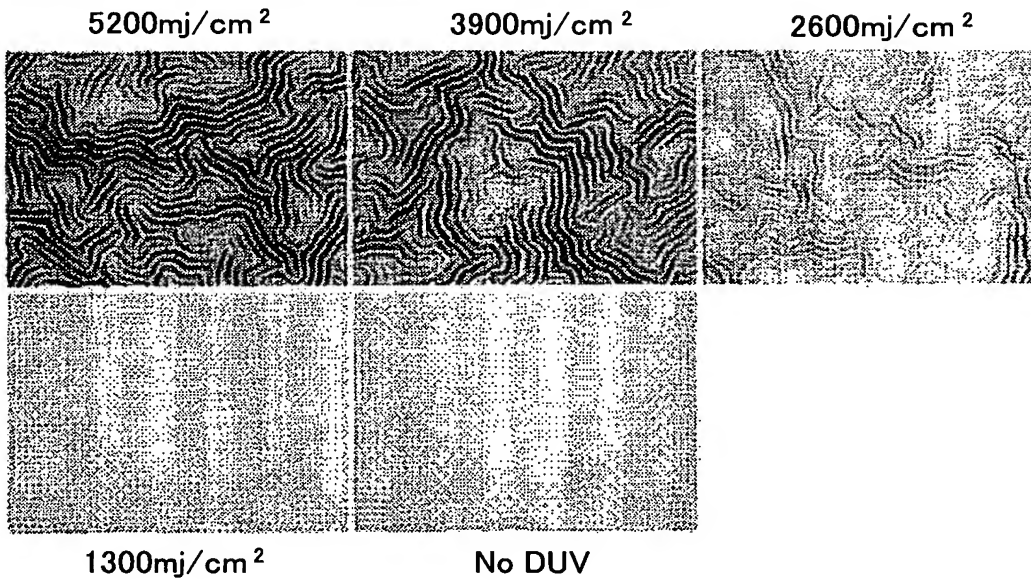


FIG. 5

Thickness  $1.7 \mu\text{m}$



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FIG. 6

Thickness  $1.4 \mu\text{m}$

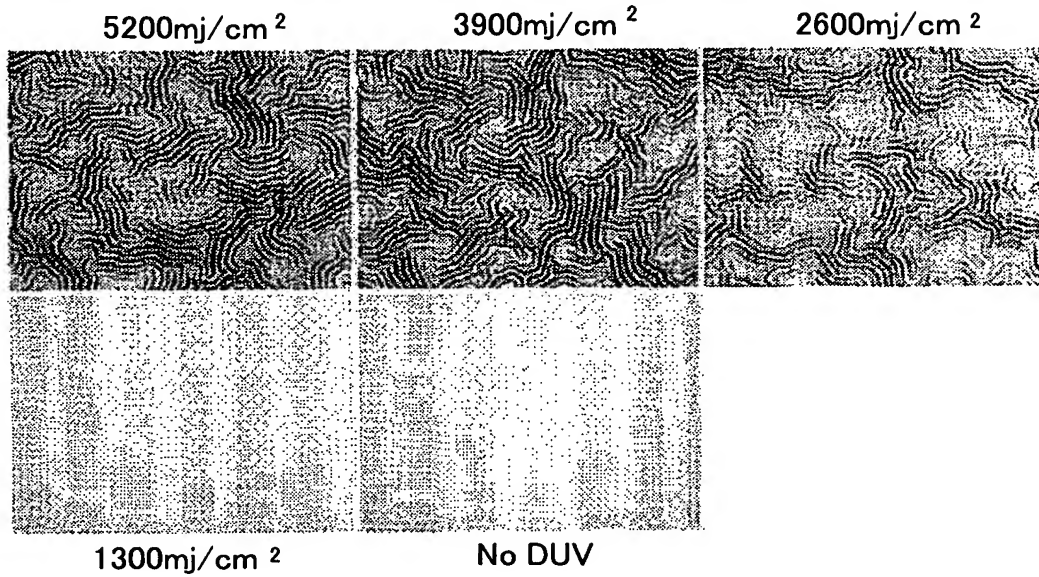
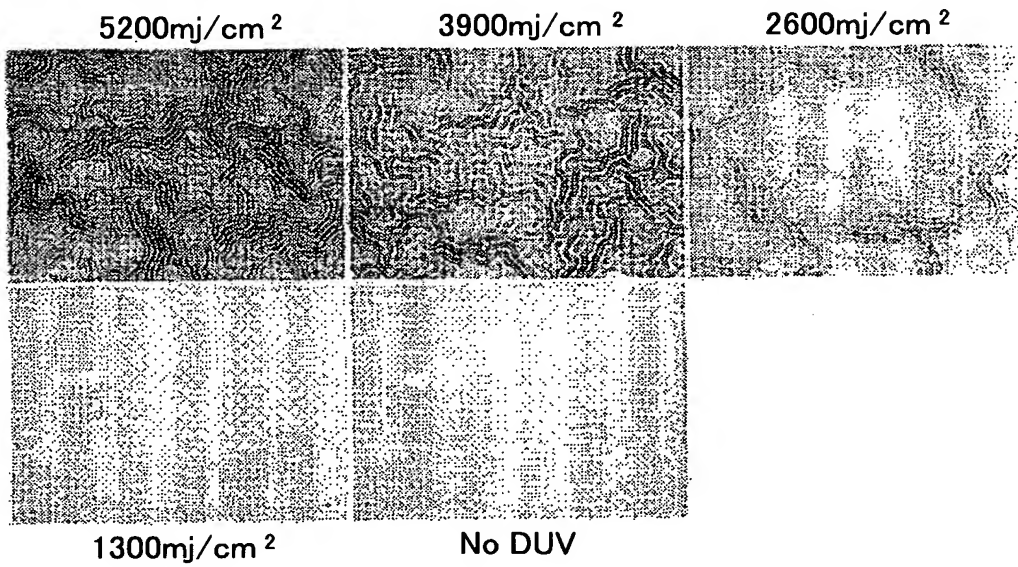


FIG. 7

Thickness  $1.0 \mu\text{m}$



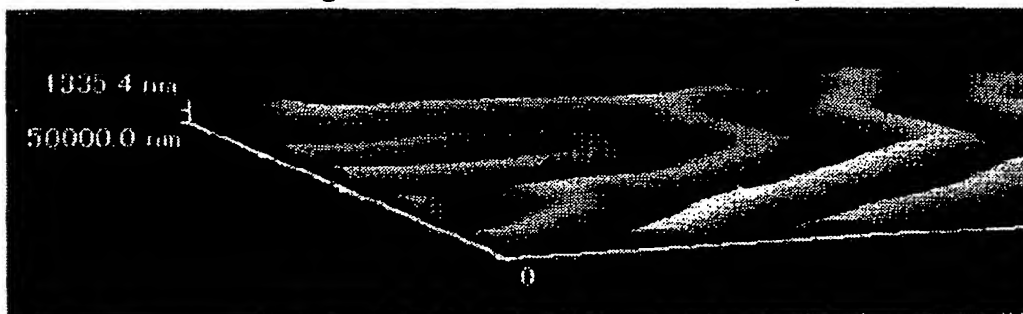
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**FIG. 8A**

Thickness  $1.7 \mu\text{m}$

Average inclination angle  $k=13^\circ$

Height difference of undulation :  $1.3 \mu\text{m}$

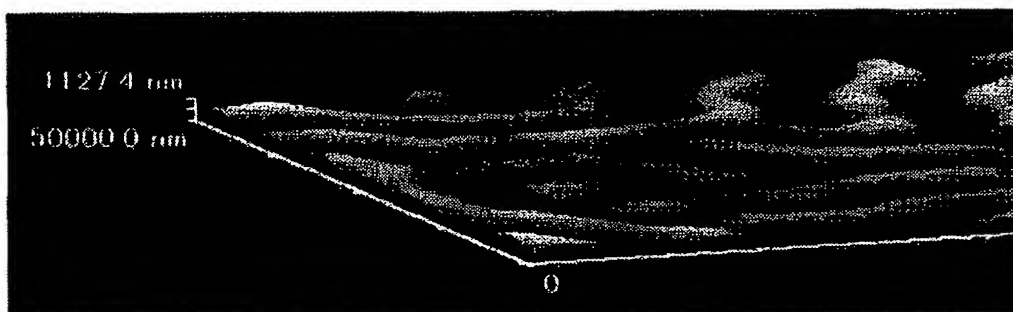


**FIG. 8B**

Thickness  $1.4 \mu\text{m}$

Average inclination angle  $k=11^\circ$

Height difference of undulation :  $1.1 \mu\text{m}$



**FIG. 8C**

Thickness  $1 \mu\text{m}$

Average inclination angle  $k=8^\circ$

Height difference of undulation :  $0.5 \mu\text{m}$

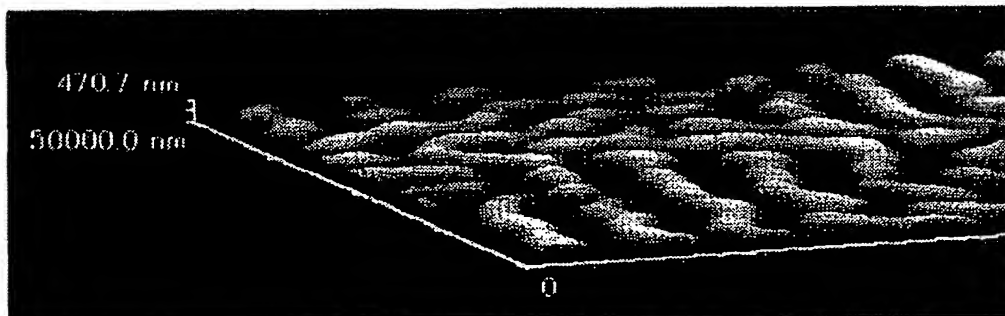


FIG. 9

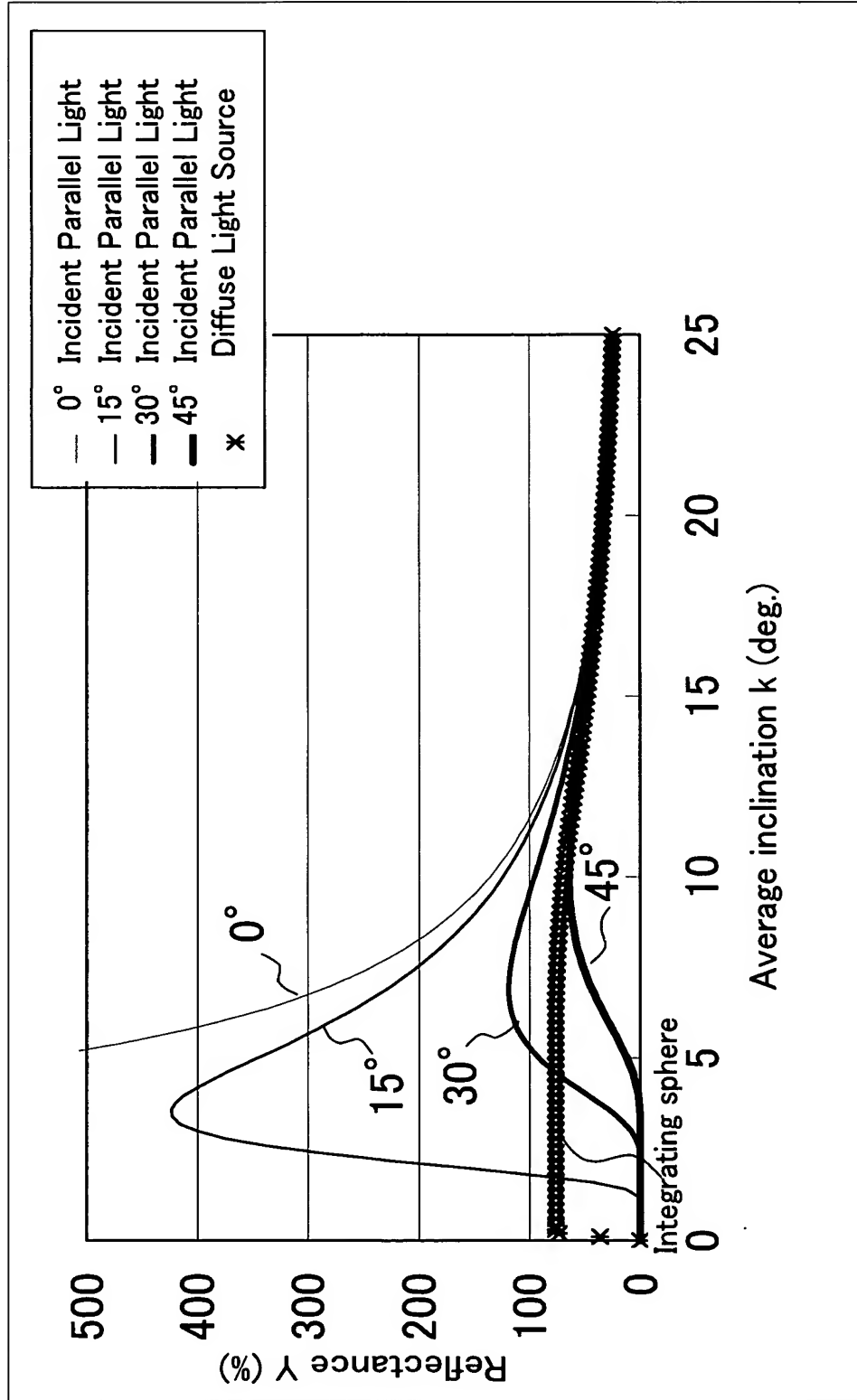


FIG. 10

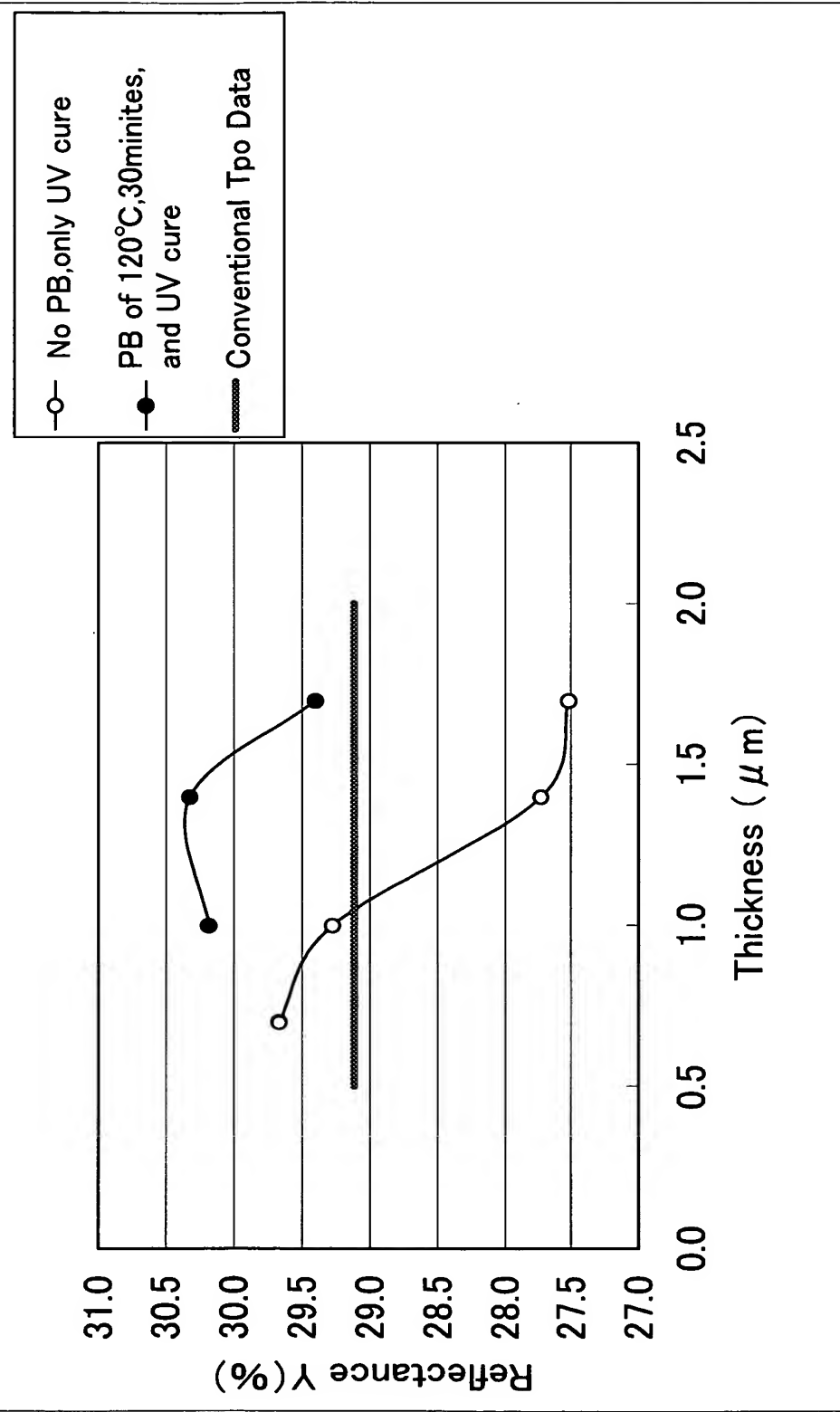




FIG. 11A

Rough undulation

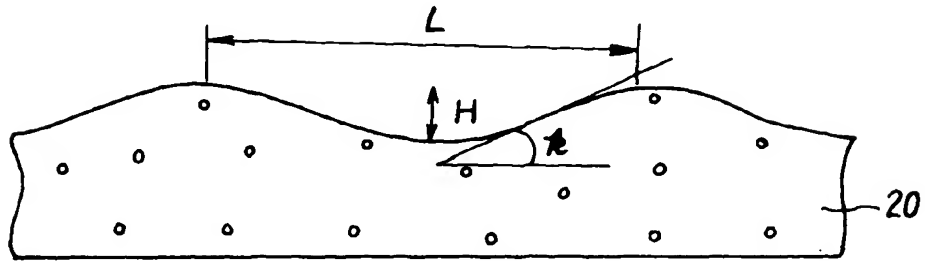
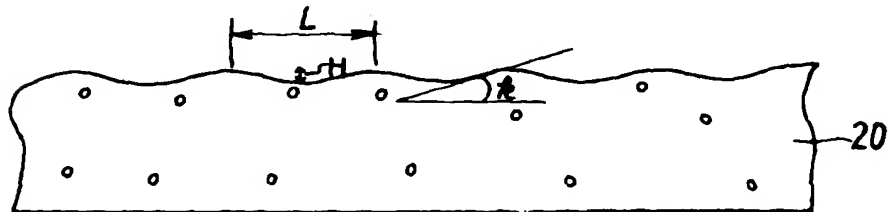


FIG. 11B

Fine undulation



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FIG. 12A



FIG. 12B

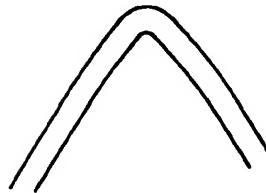


FIG. 12C

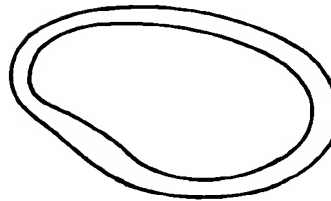
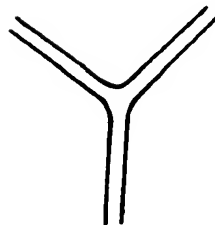


FIG. 12D



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FIG. 13A

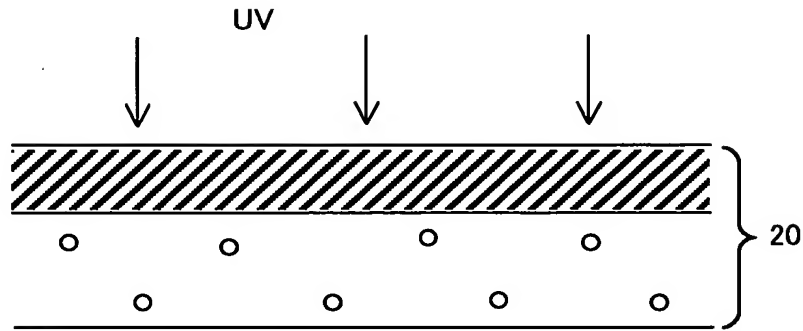
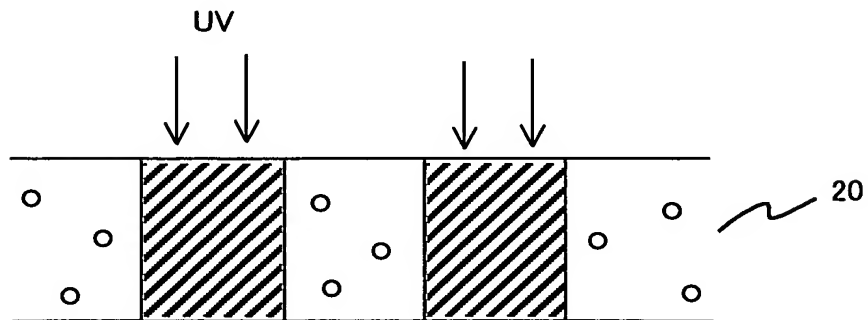


FIG. 13B



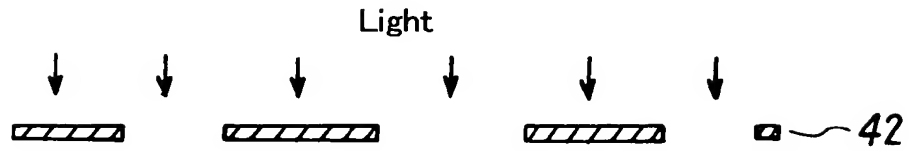


FIG. 14A

Exposure

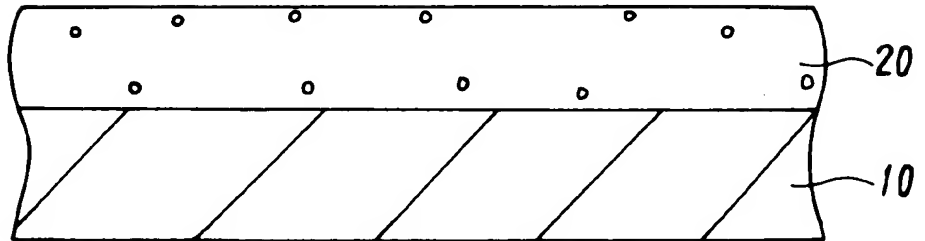


FIG. 14B

Development  
 UV irradiation

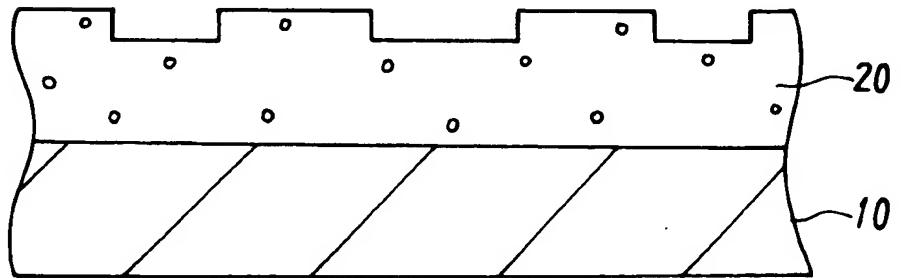


FIG. 14C

Final baking

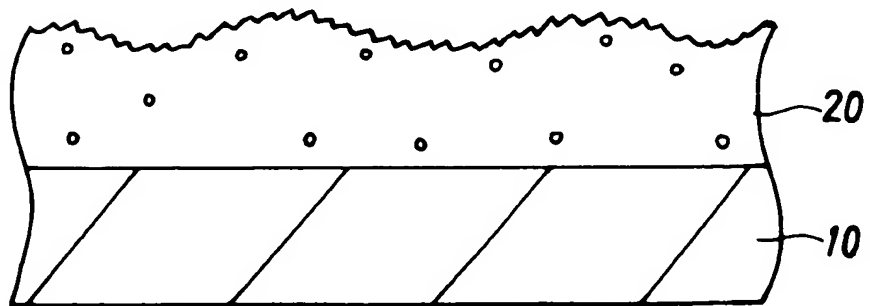


FIG. 15

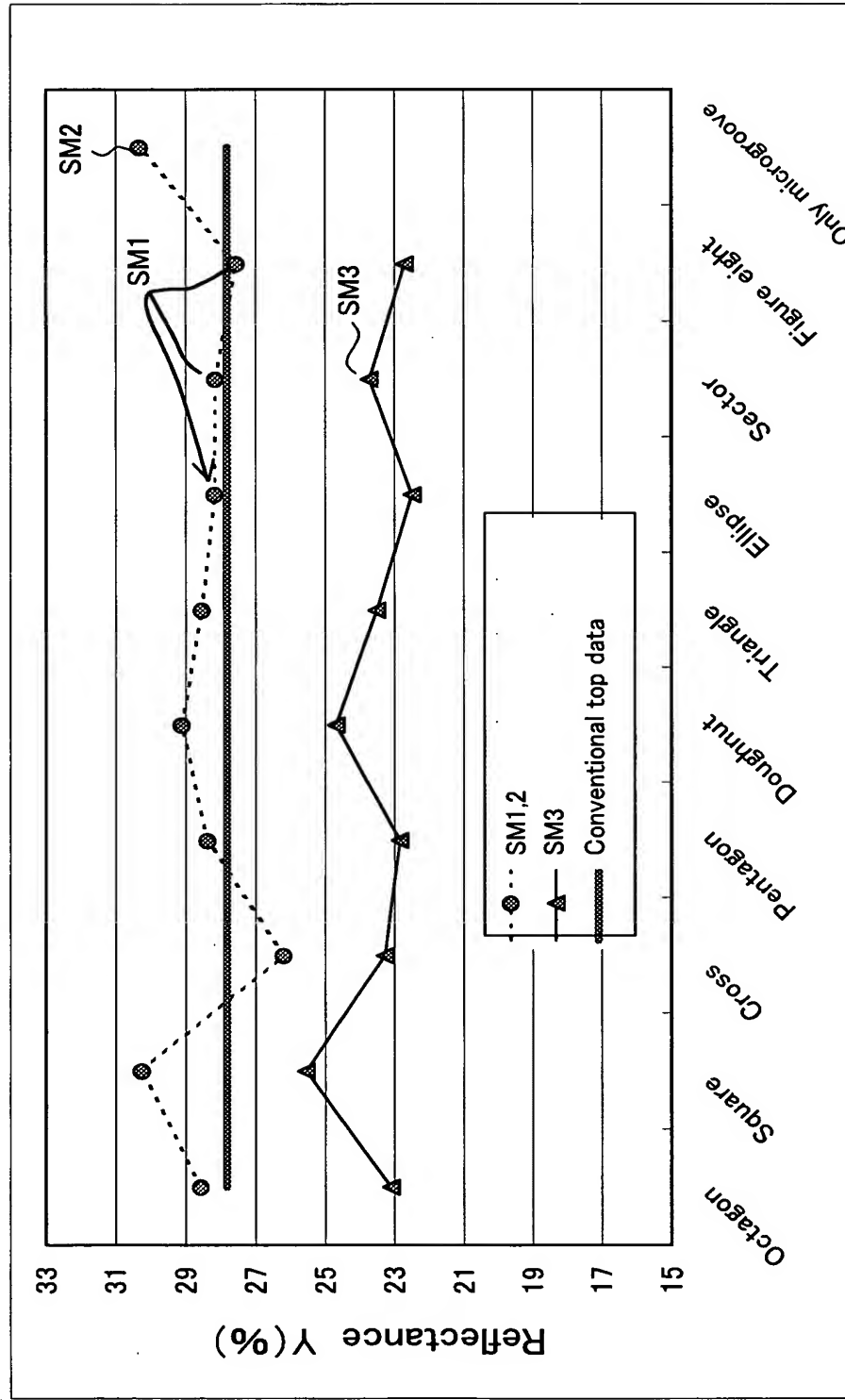


FIG. 16A

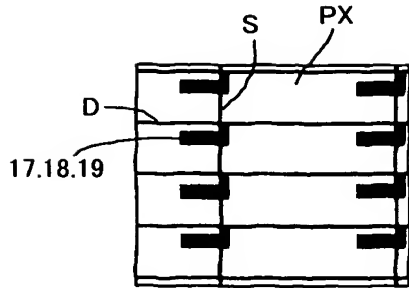


FIG. 16C

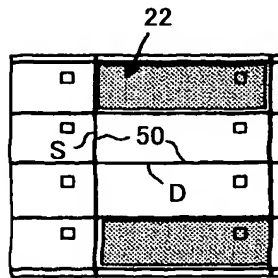


FIG. 16E

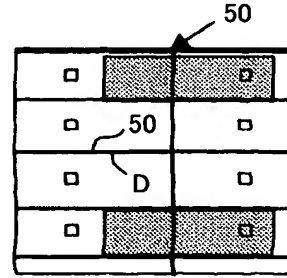


FIG. 16B

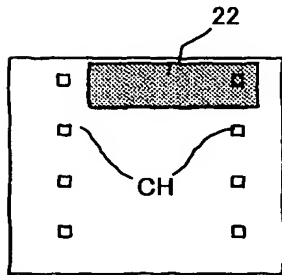


FIG. 16D

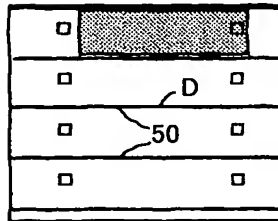
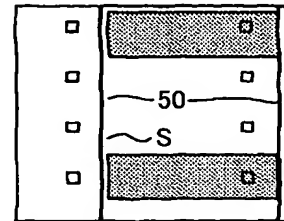


FIG. 16F



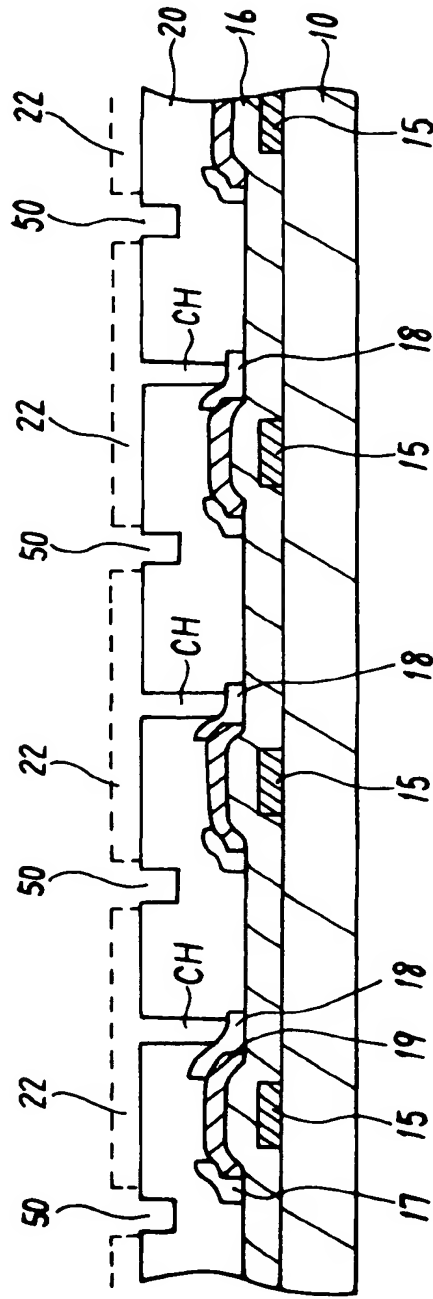
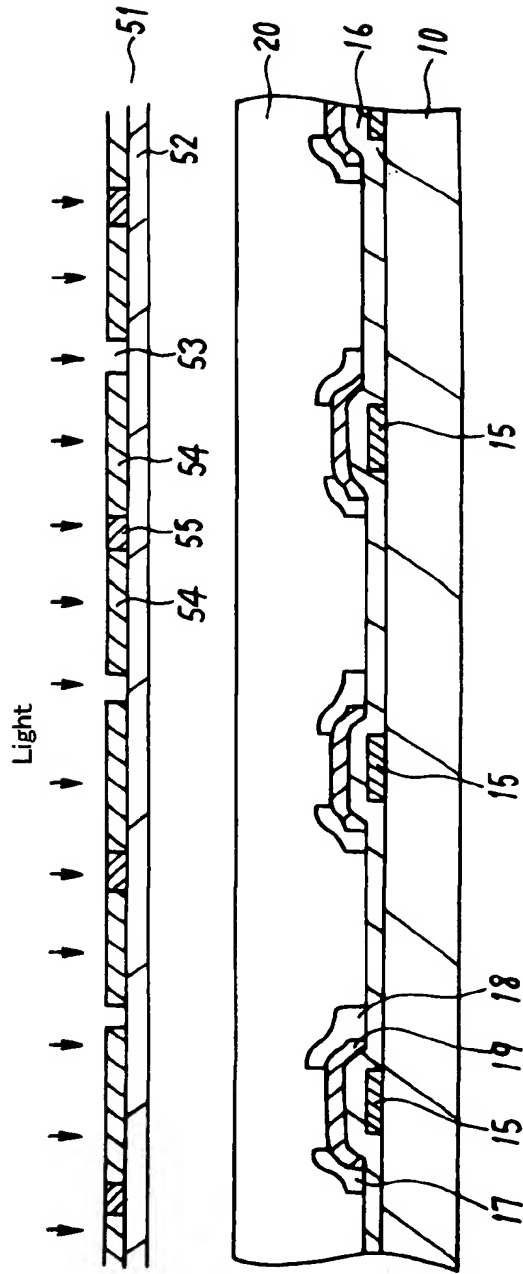
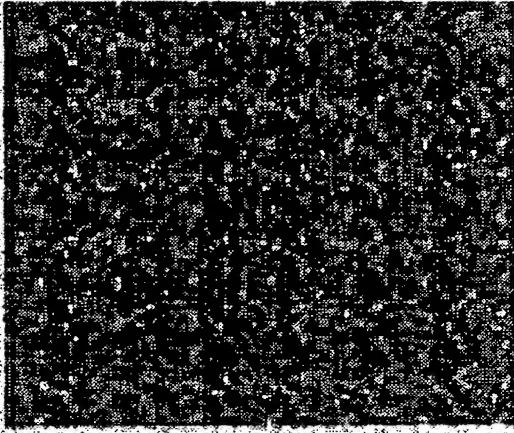
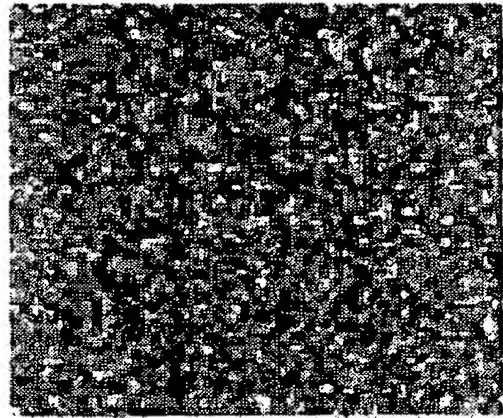


FIG. 18A



with separation line

FIG. 18B



without separation line

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FIG. 19

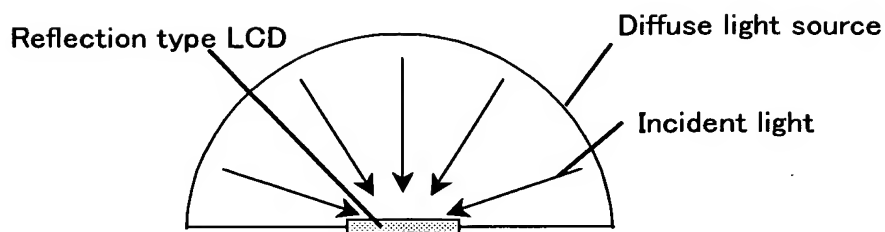
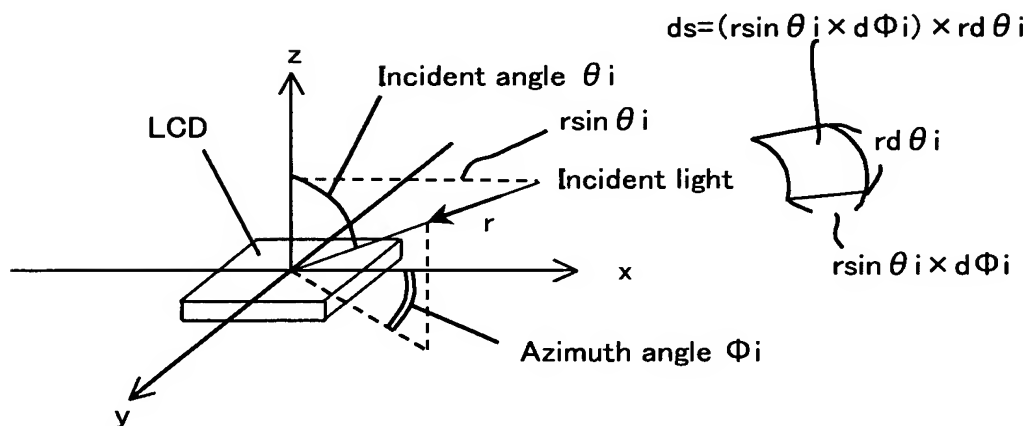


FIG. 20



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FIG. 21

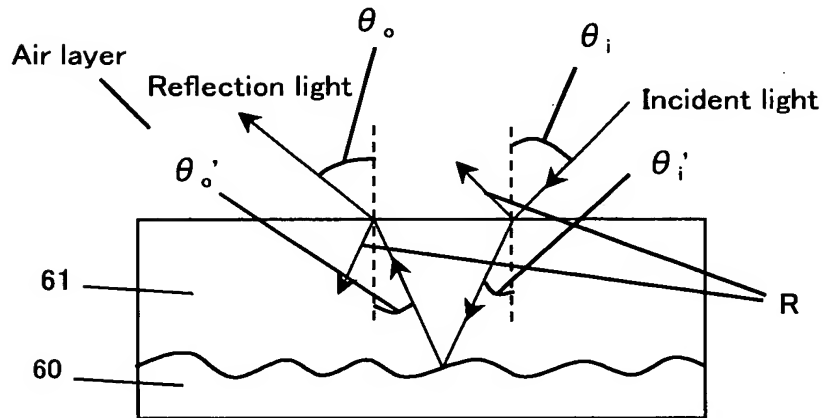


FIG. 22

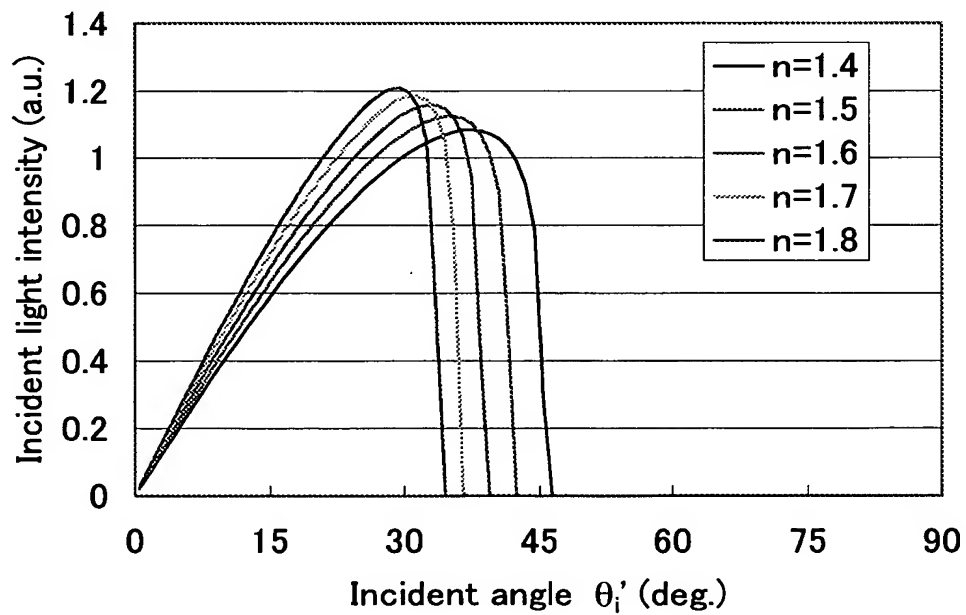


FIG. 23

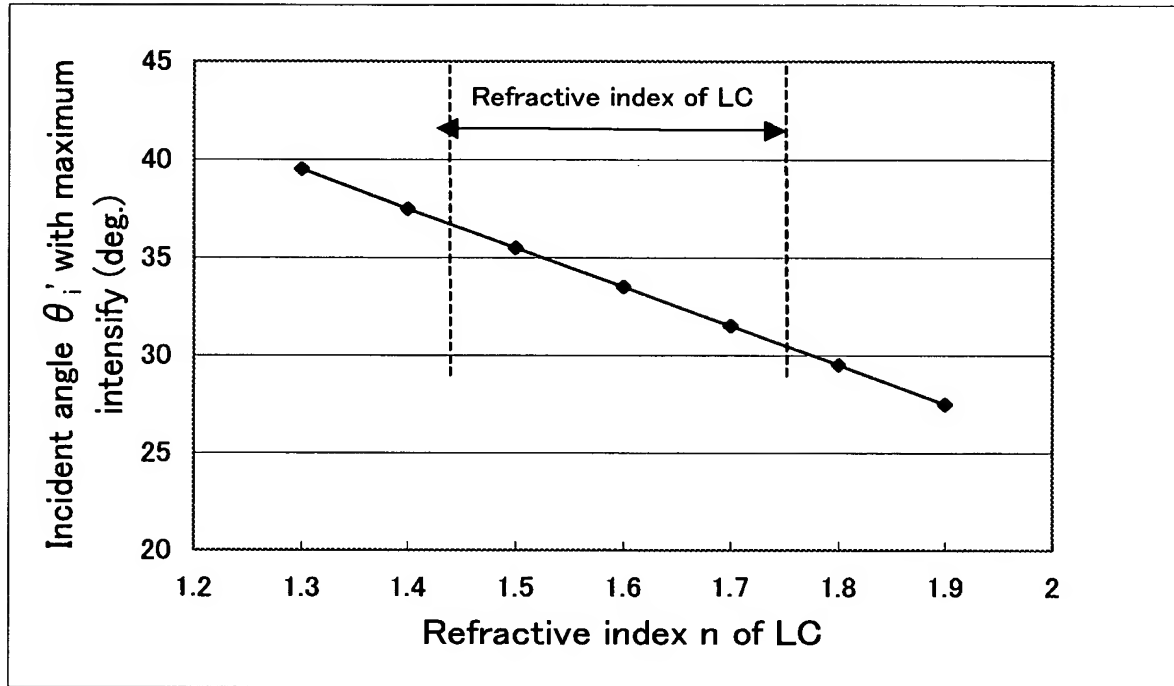


FIG. 24

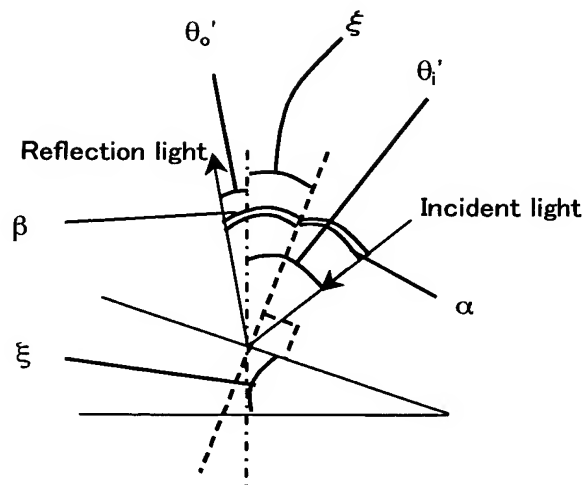


FIG. 25

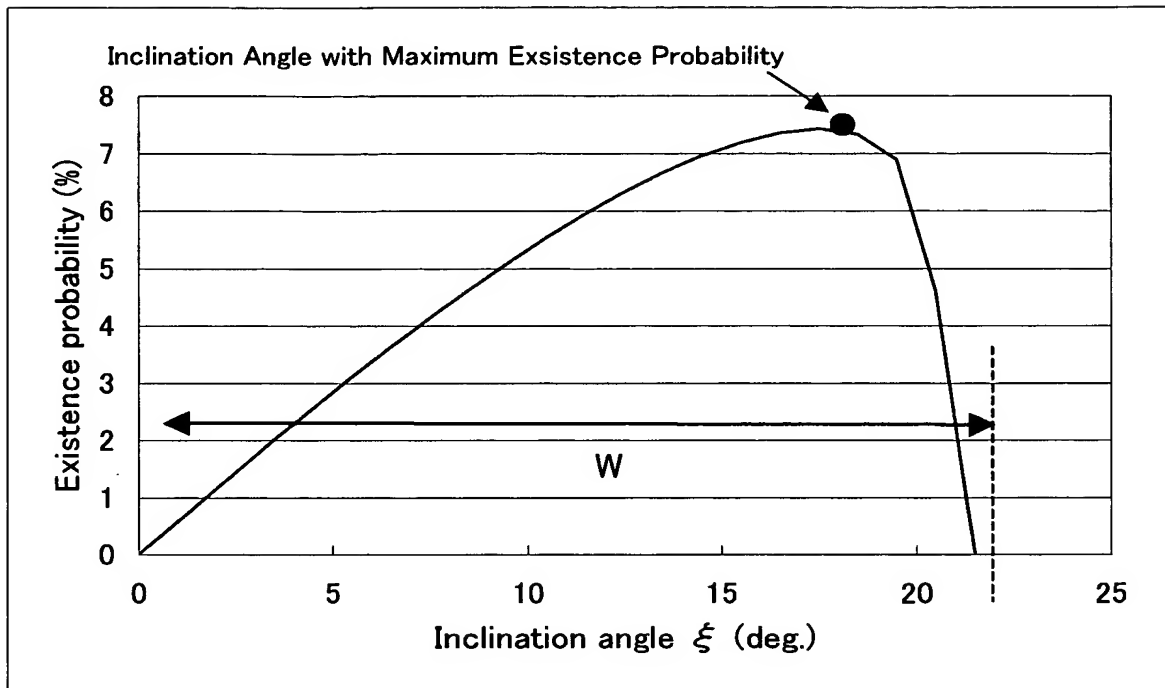


FIG. 26

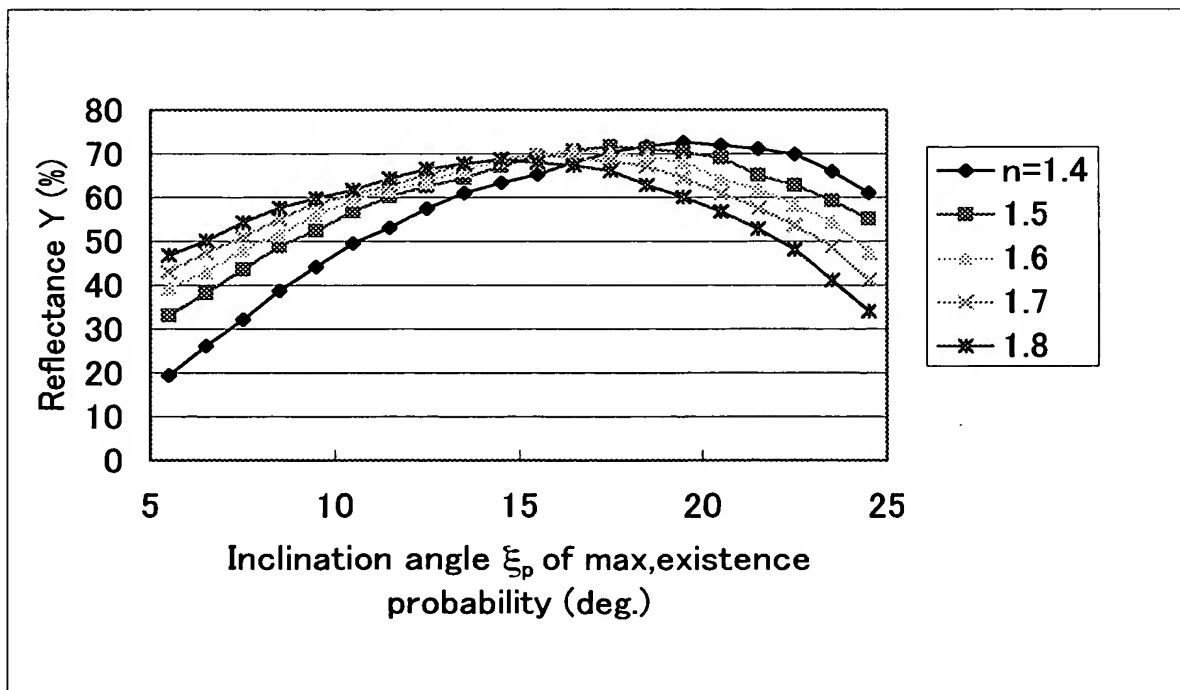
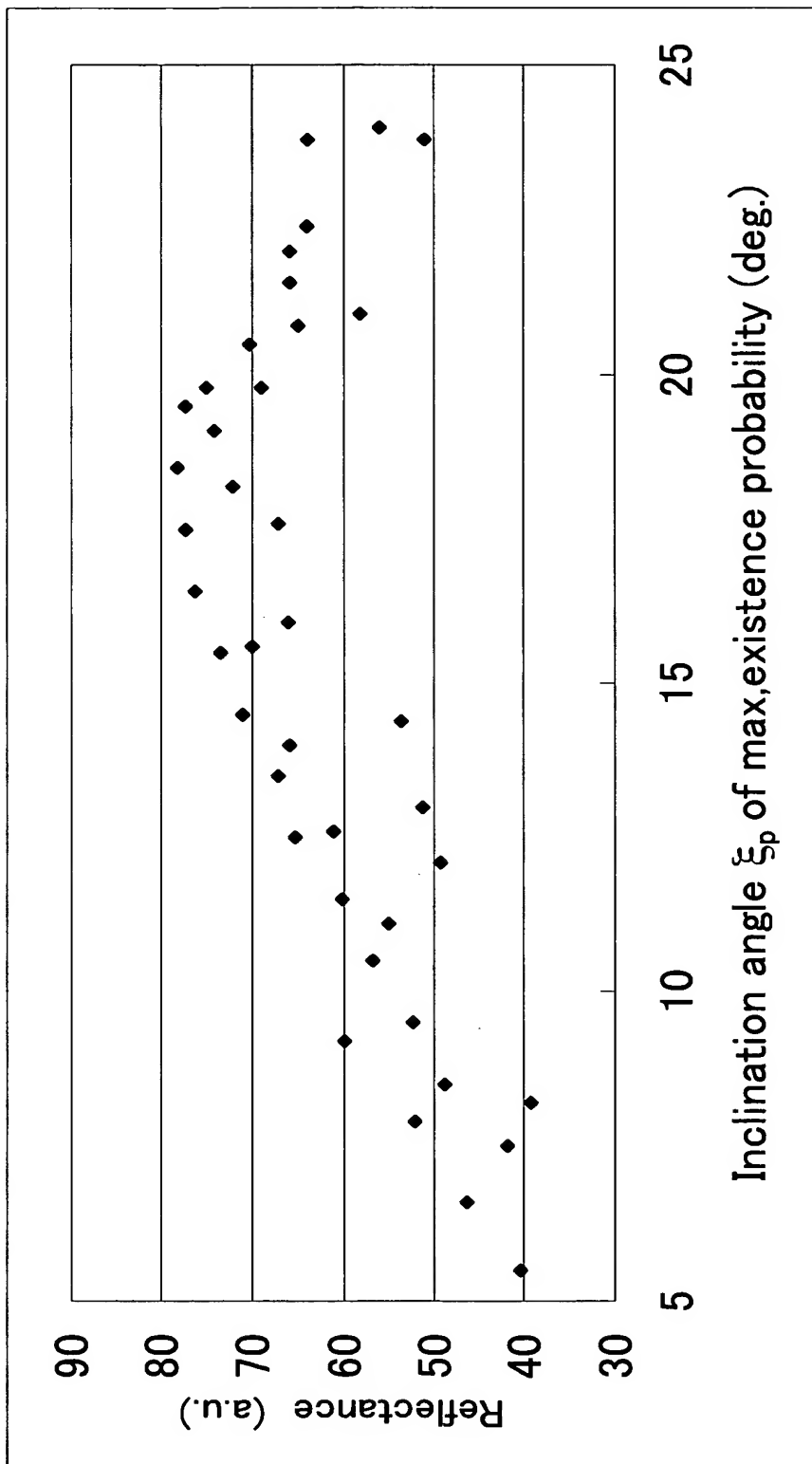


FIG. 27



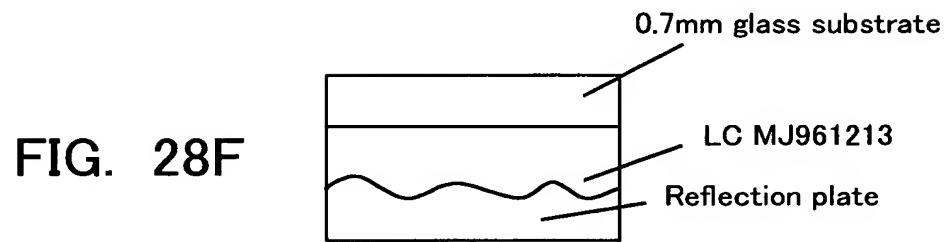
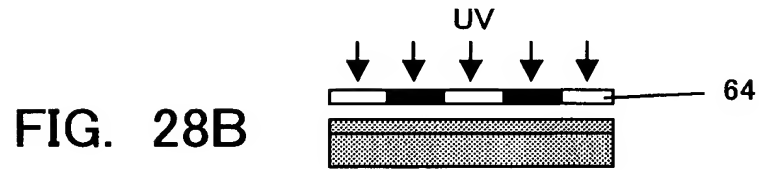
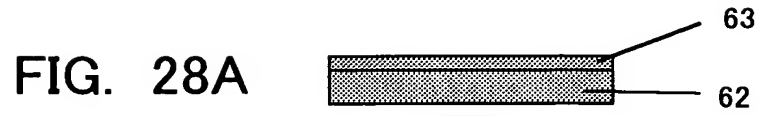


FIG. 29A

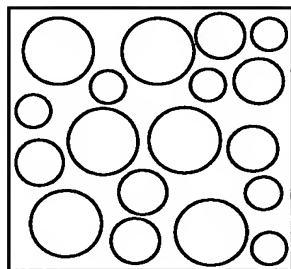


FIG. 29B

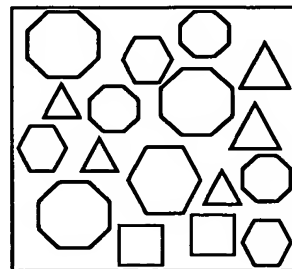


FIG. 30

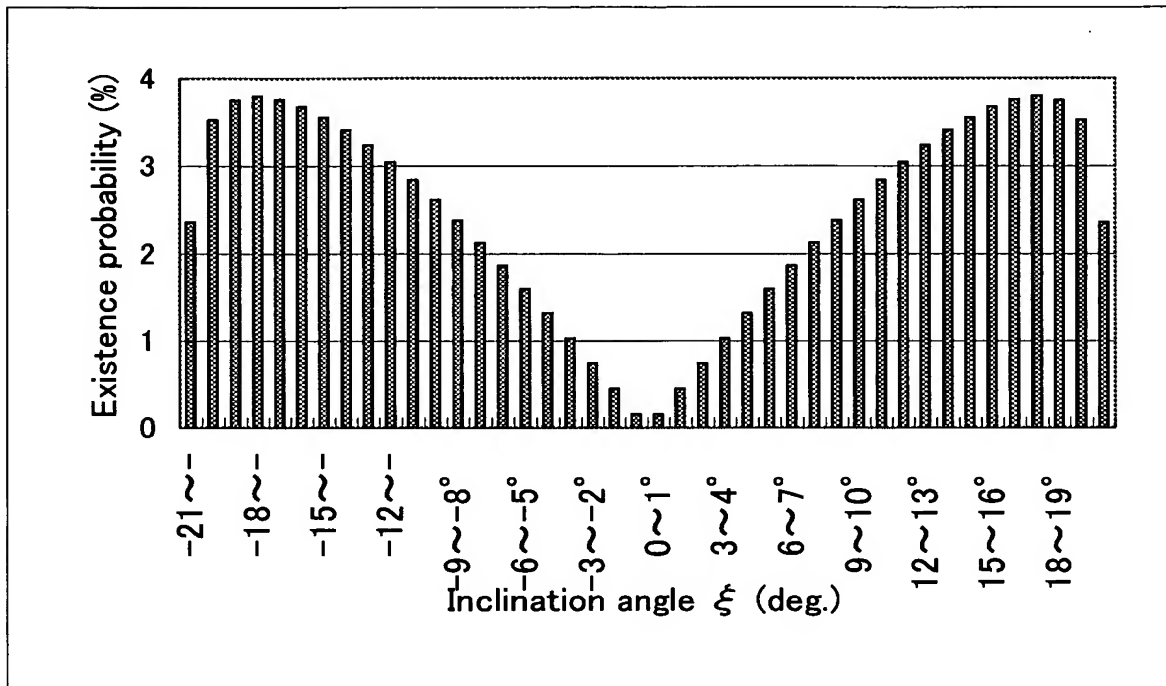


FIG. 31

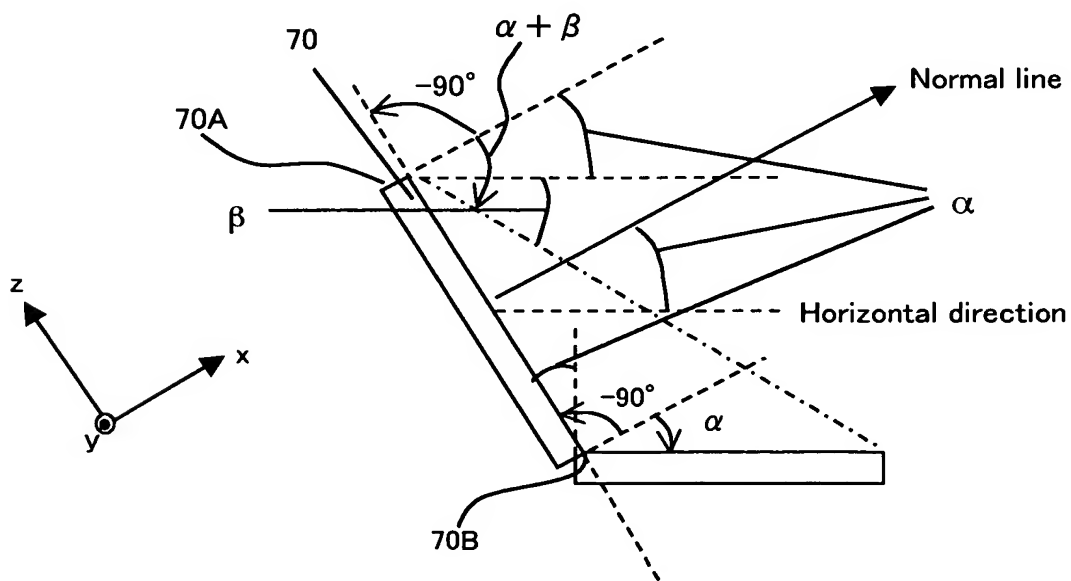


FIG. 32

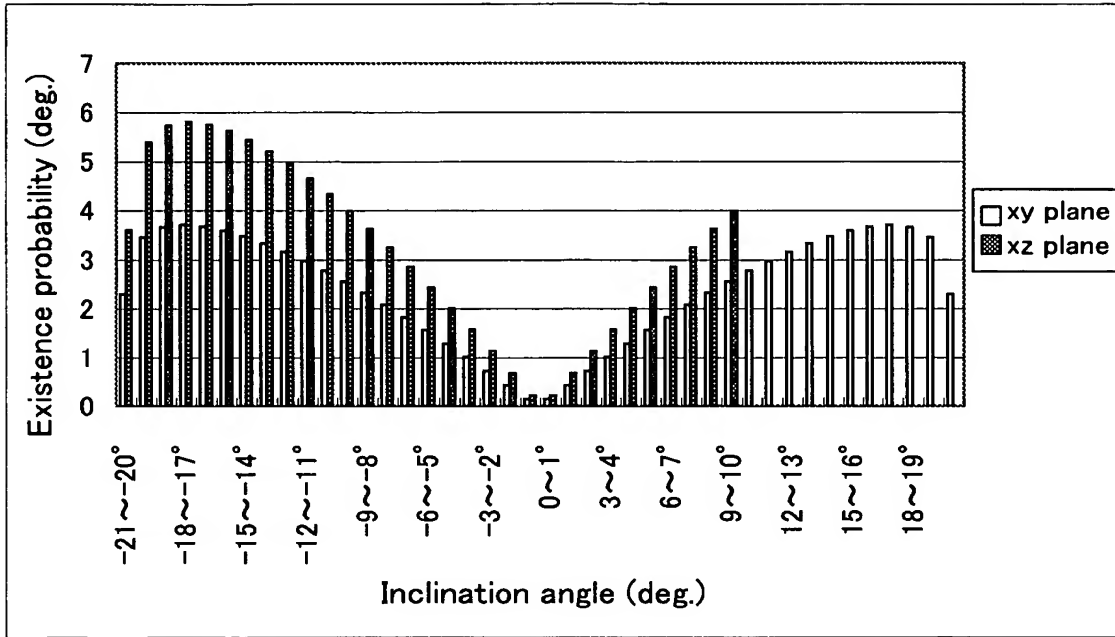
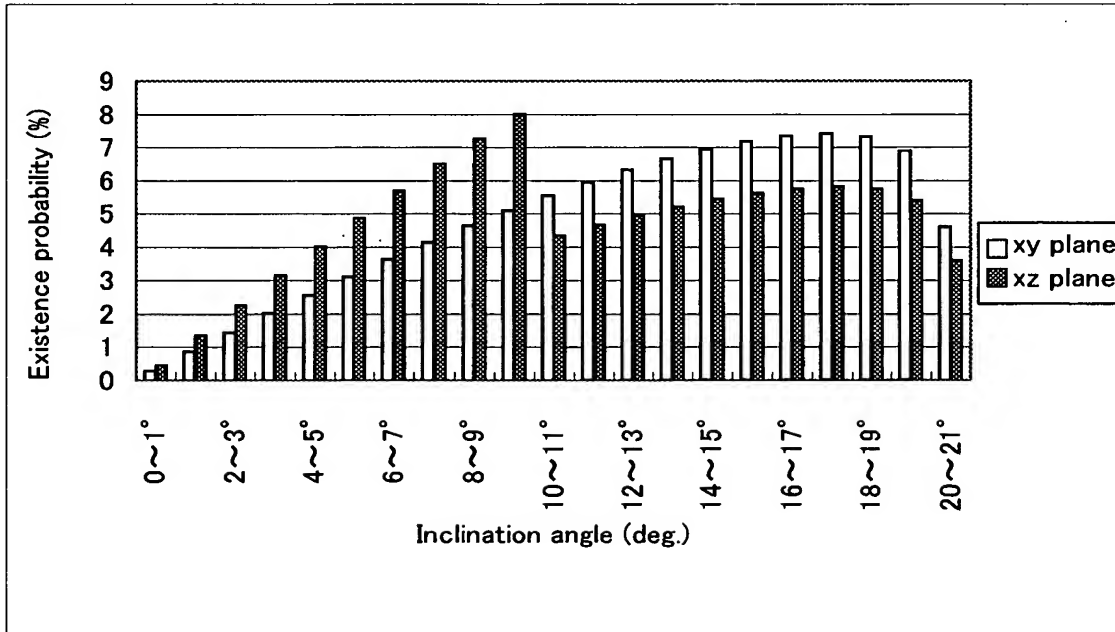


FIG. 33





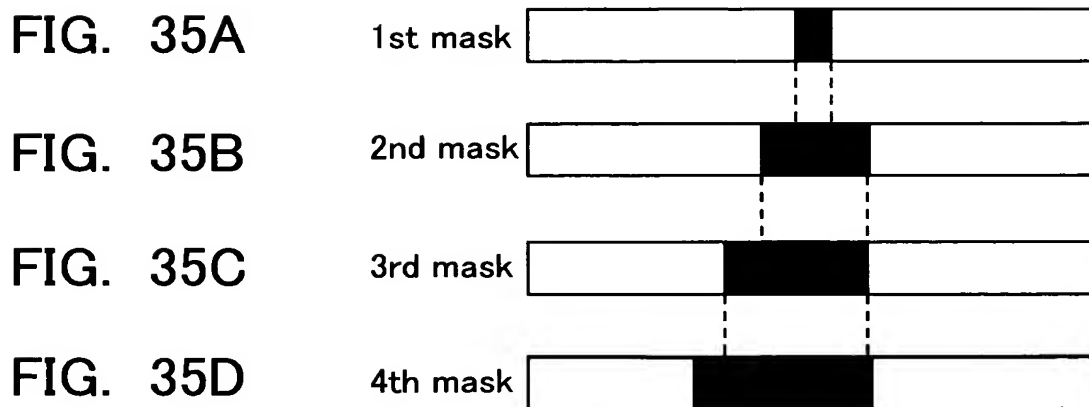
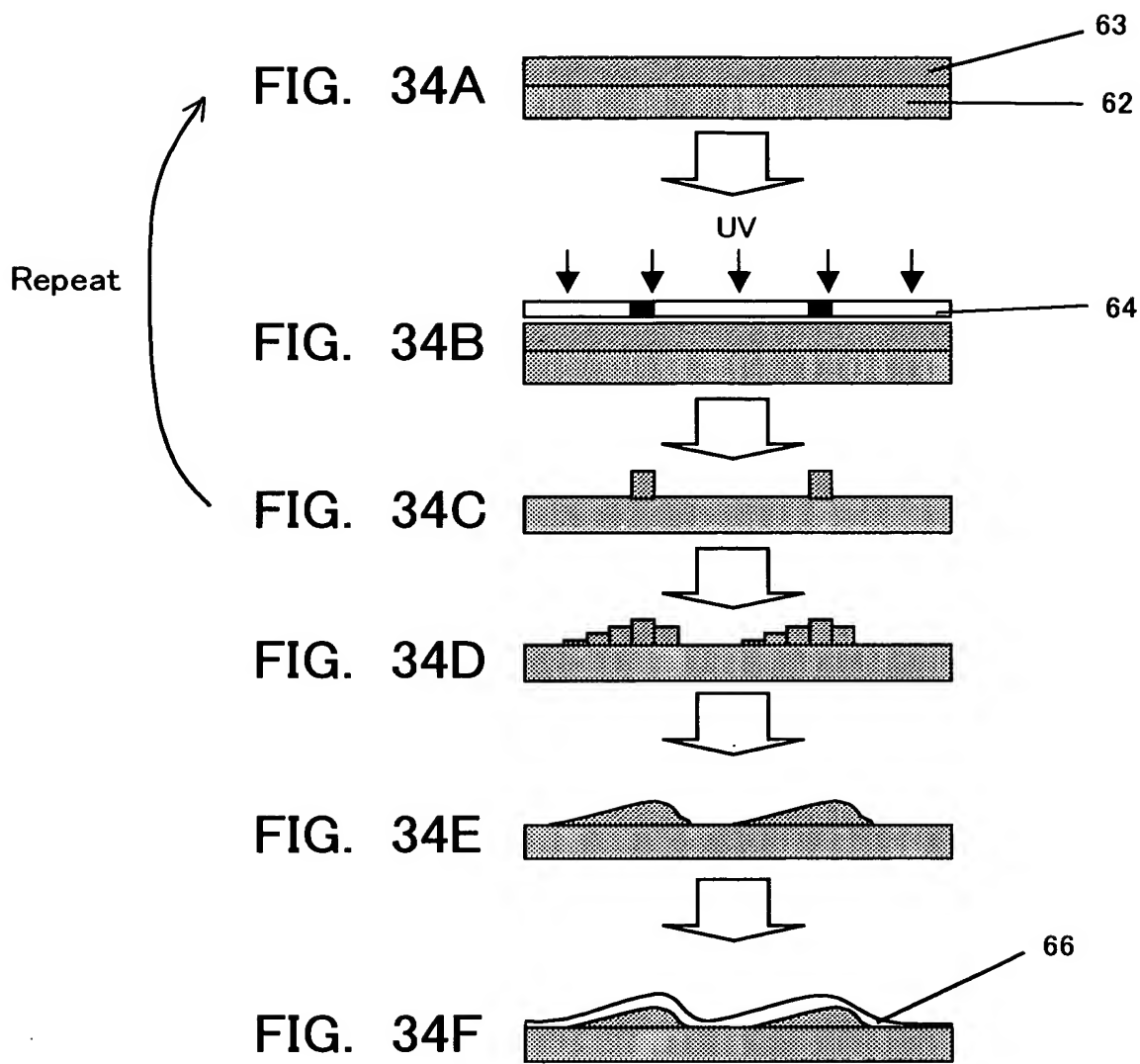
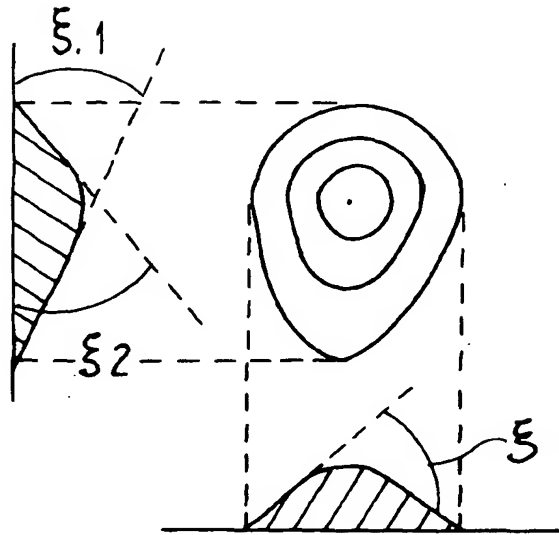


FIG. 36



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FIG. 37

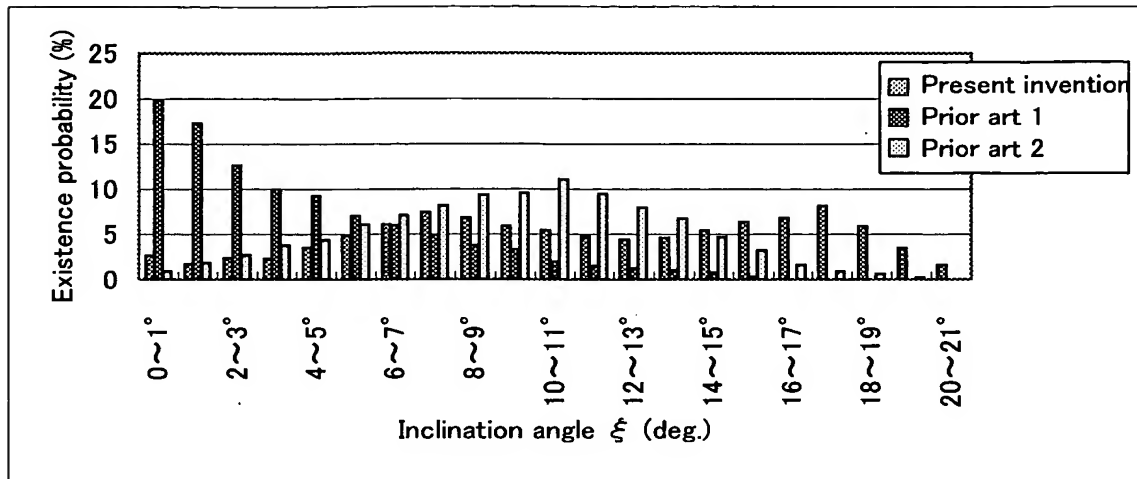


FIG. 38

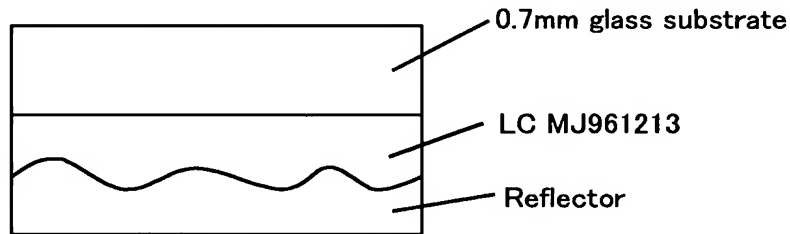


FIG. 39

Measurement result of reflectance

	Present invention	Prior art 1	Prior art 2
Reflectance	61%	31%	53%

Present invention : Existence probability of indication angle is maximum at 8° - 18°

Prior art 1 : Existence probability of indication angle is maximum at only 0°

Prior art 2 : Existence probability of indication angle is maximum at only 10°

FIG. 40

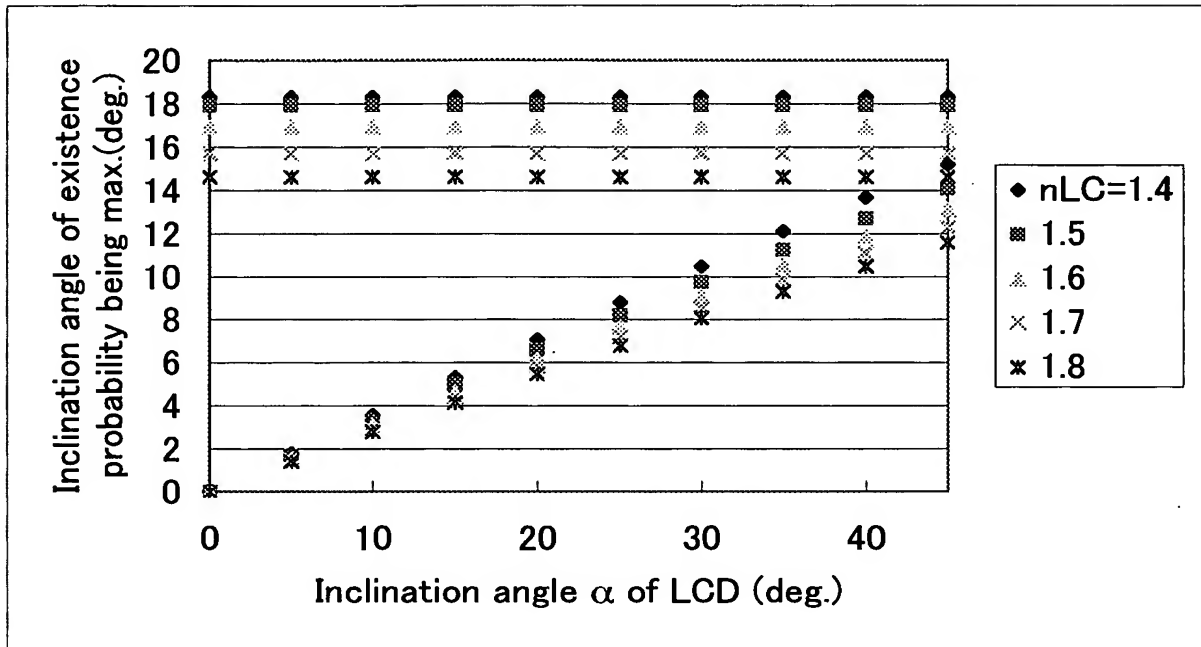


FIG. 41

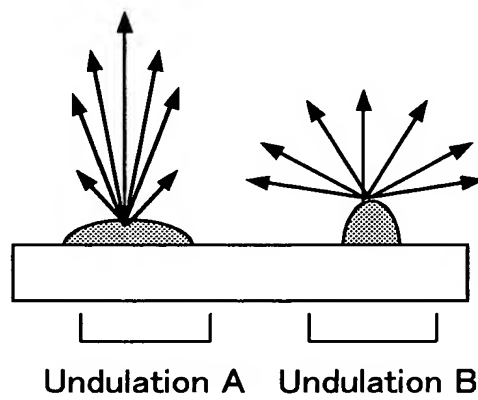
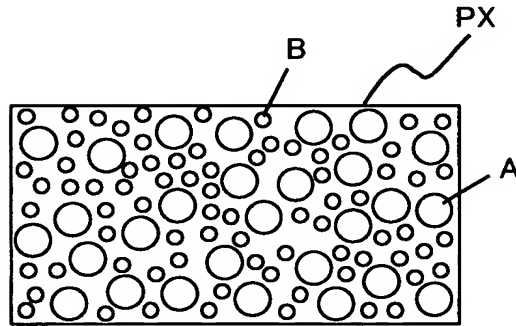


FIG. 42



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FIG. 43A



FIG. 43B

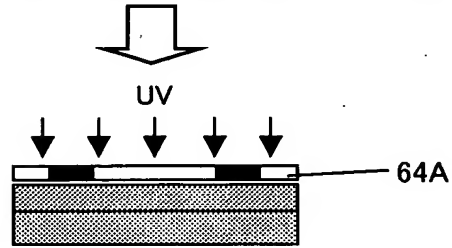


FIG. 43C

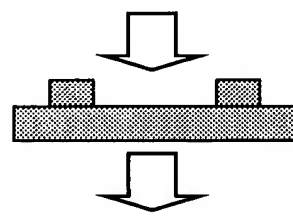


FIG. 43D

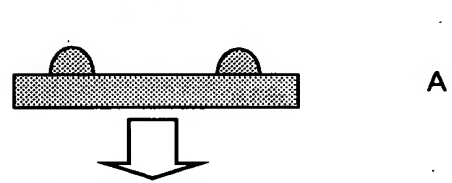


FIG. 43E



FIG. 43F

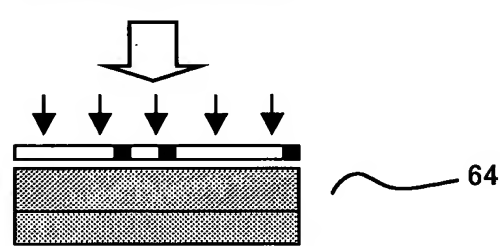


FIG. 43G

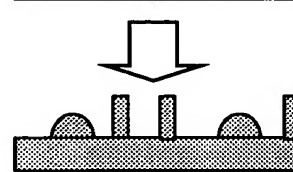


FIG. 43H

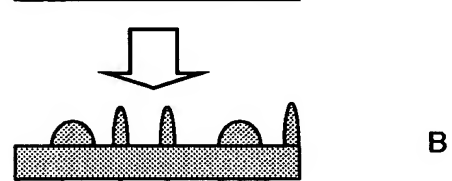
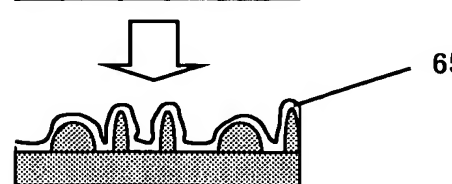


FIG. 43I



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FIG. 44

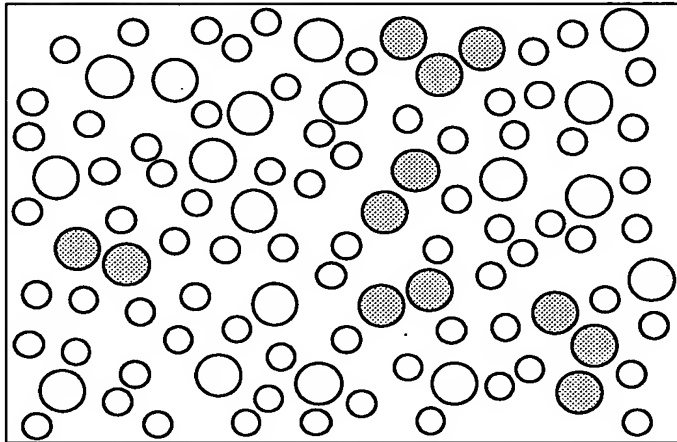
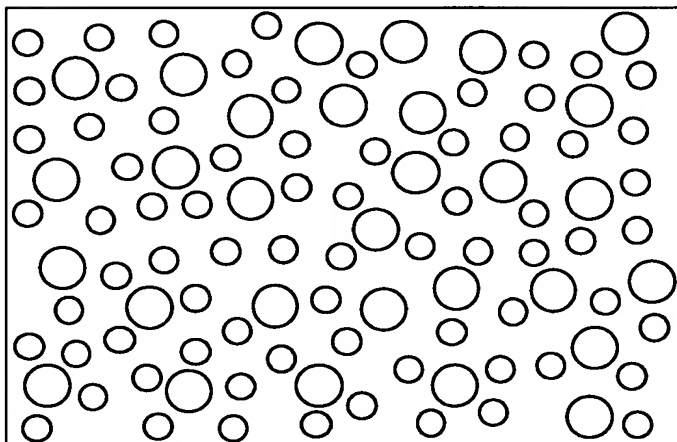


FIG. 45



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FIG. 46A

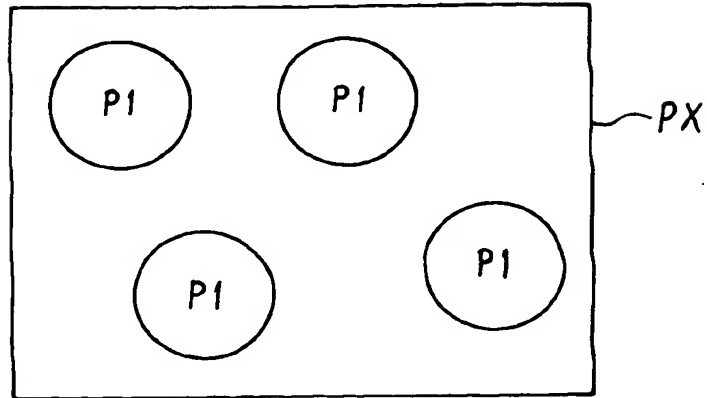


FIG. 46B

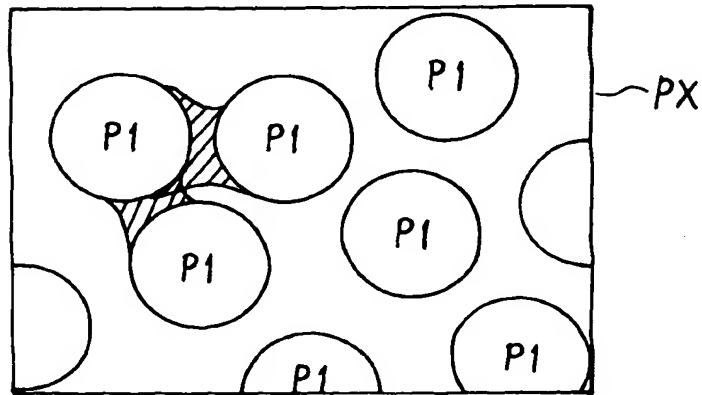
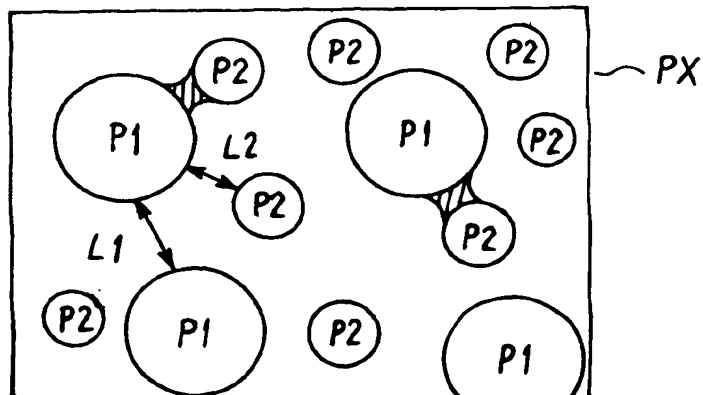


FIG. 46C



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FIG. 47

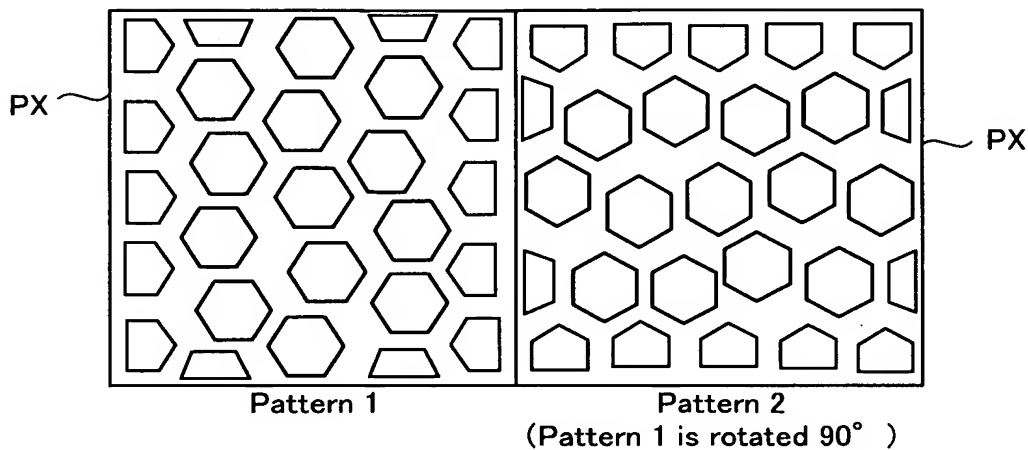


FIG. 48

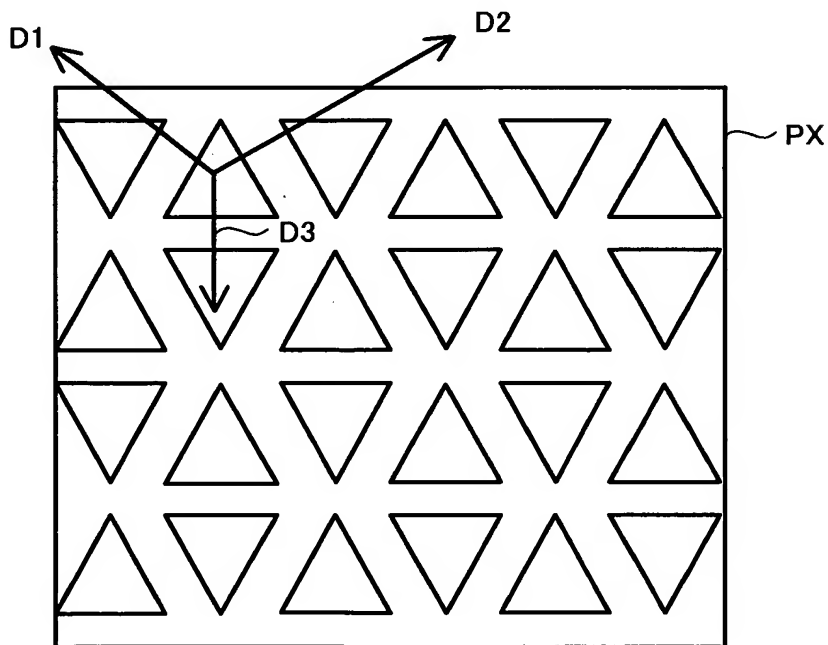
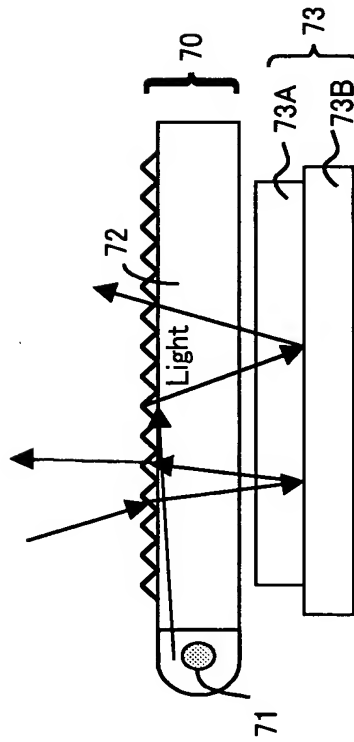
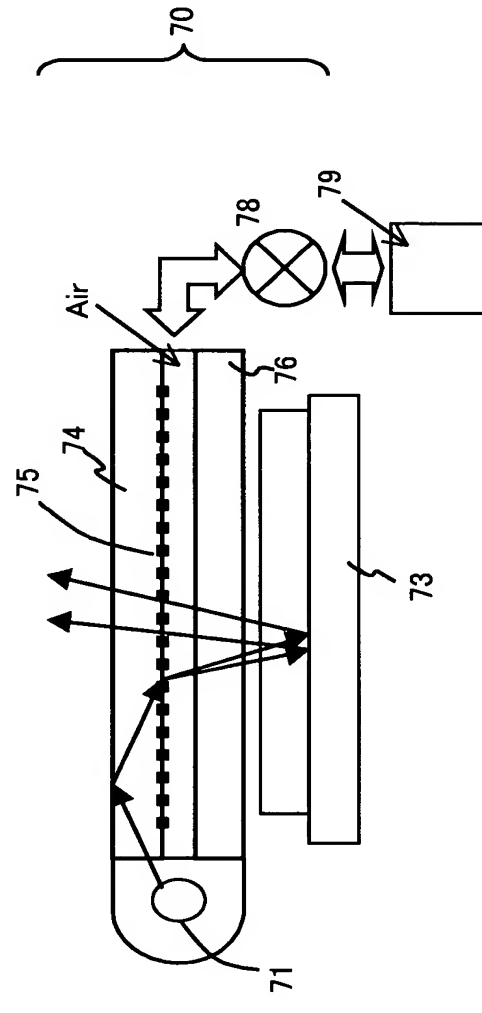
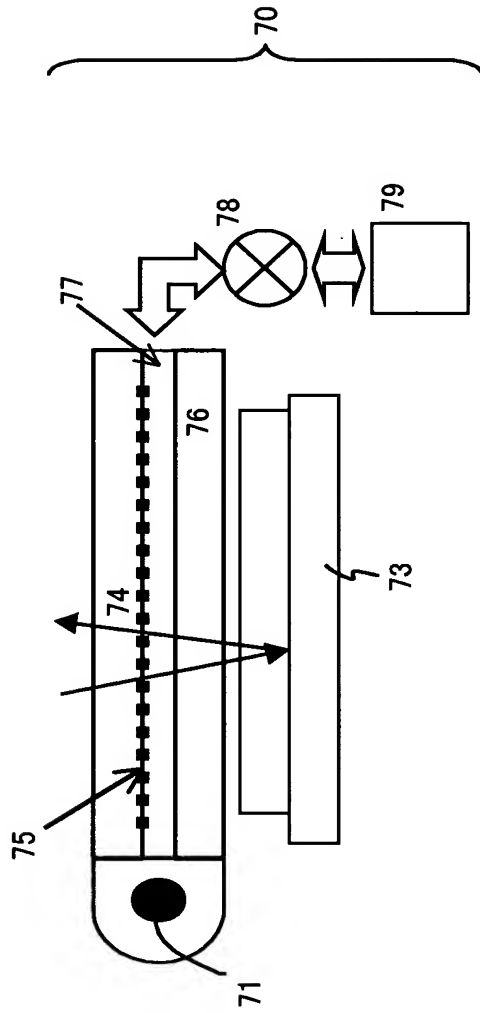
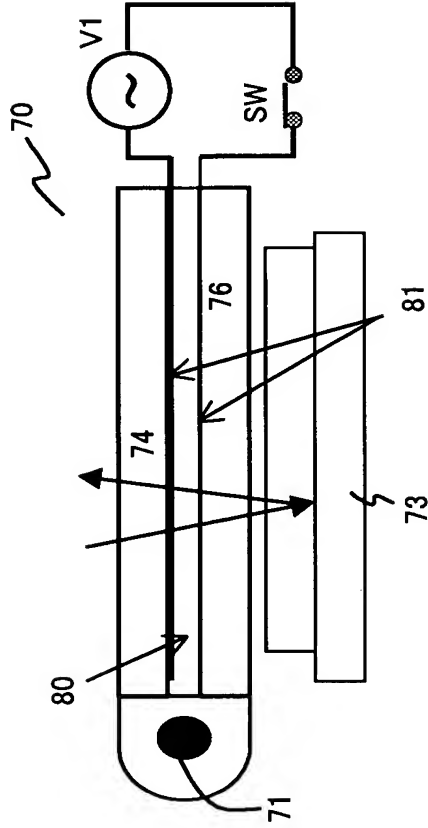


FIG.49

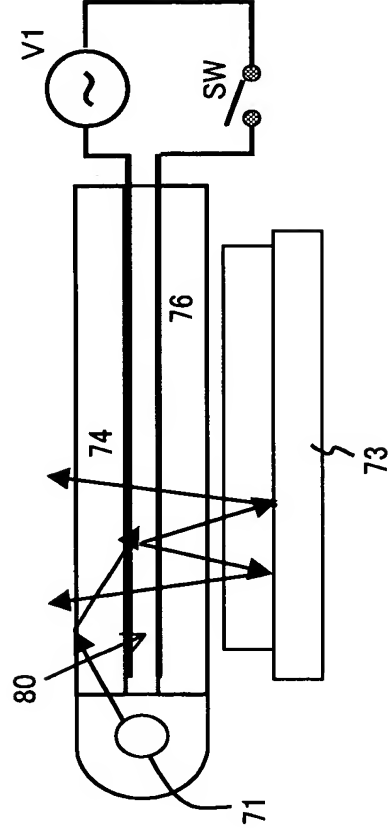
Prior Art



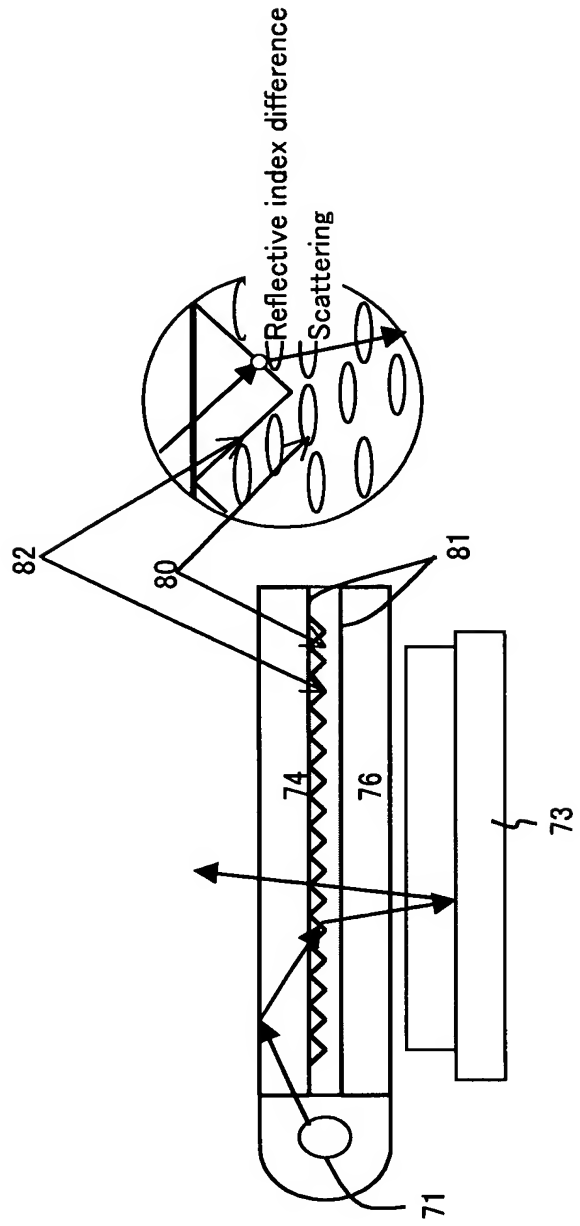
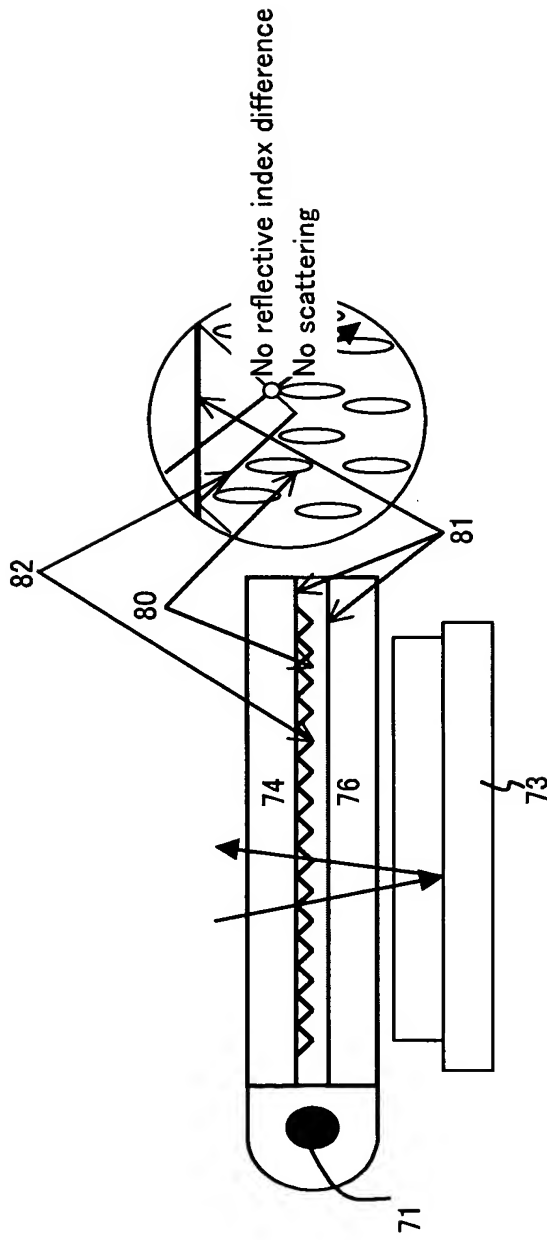




**FIG. 51A**  
 At bright place



**FIG. 51B**  
 At dark place



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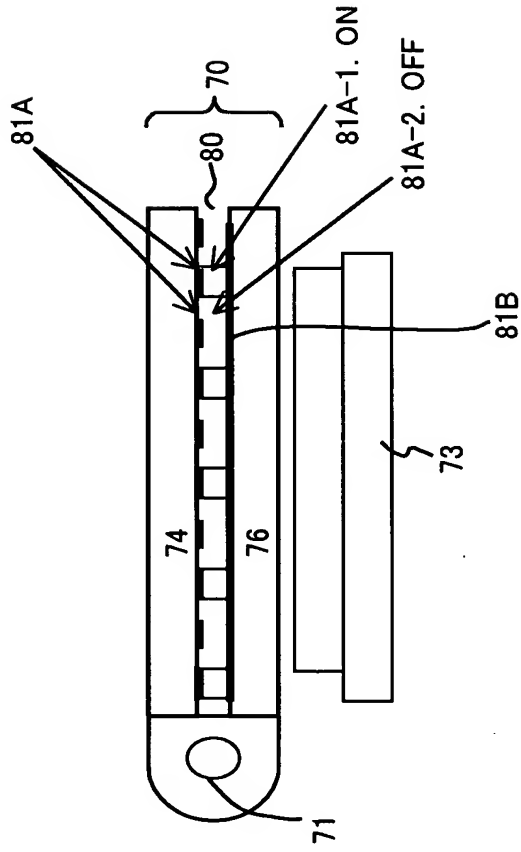


FIG. 53A

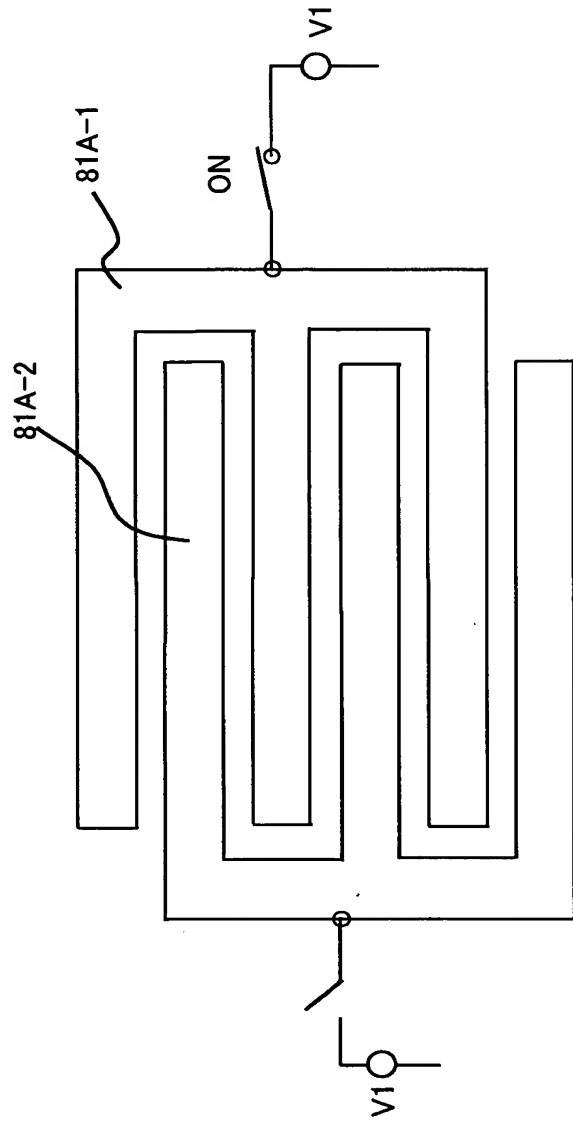
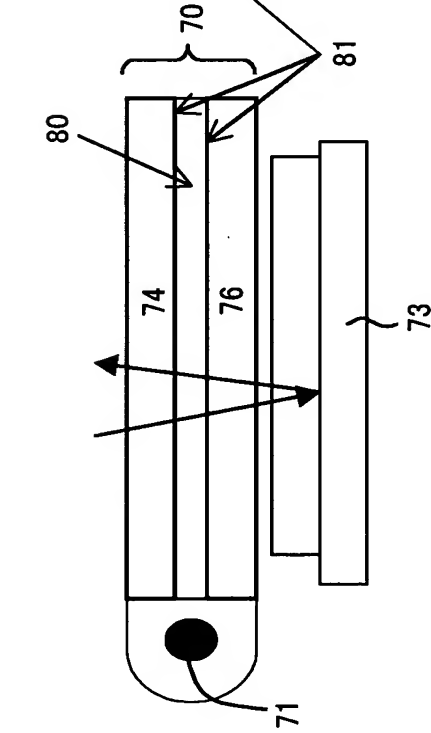


FIG. 53B

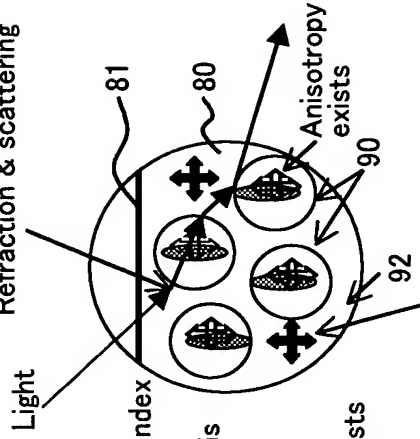
FIG.54A

At bright place

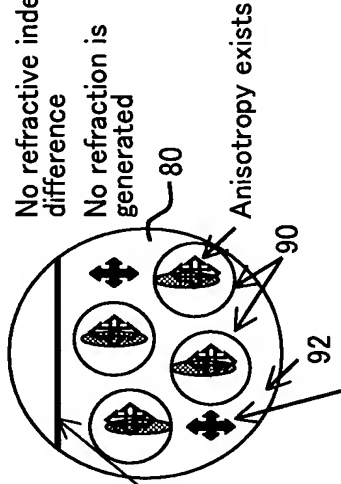


Liquid crystal A

Refractive index difference  
in horizontal direction  
Refraction & scattering



Liquid crystal B

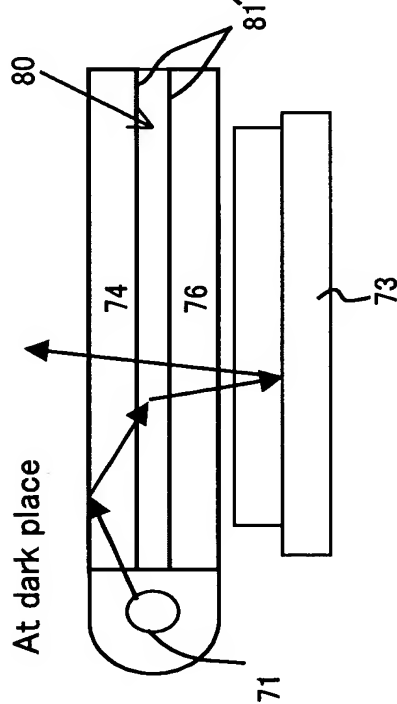


No anisotropy in polymer

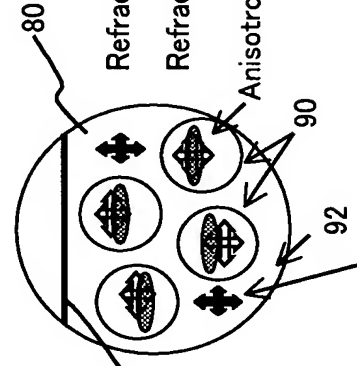
Anisotropy exists in polymer

FIG.54B

At dark place



Refractive index difference  
Refraction is generated



Anisotropy exists in polymer

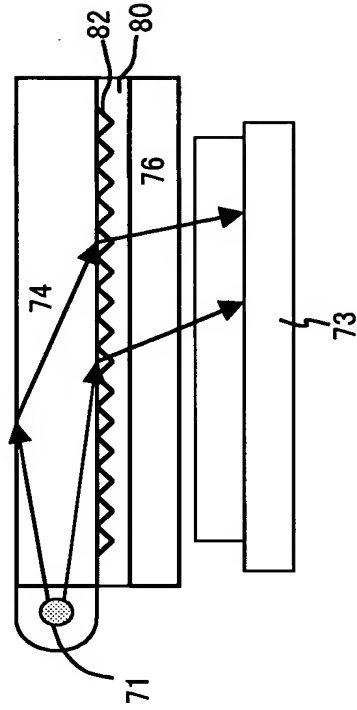


FIG. 55

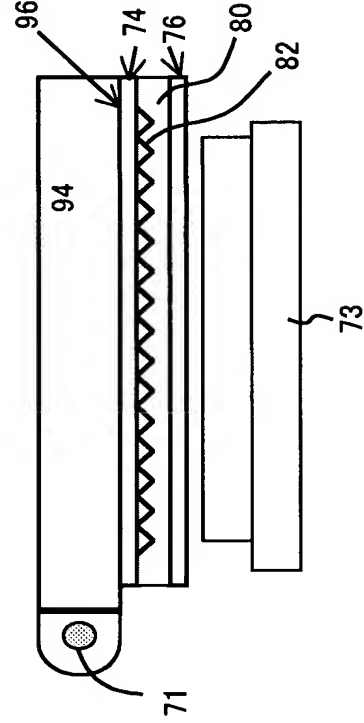


FIG. 56



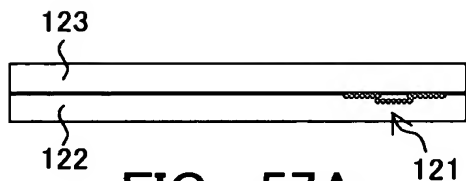


FIG. 57A

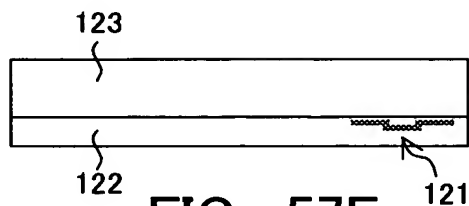


FIG. 57F

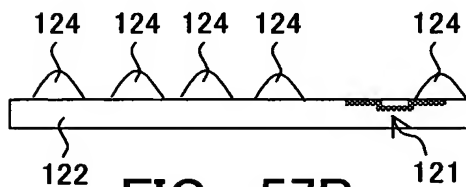


FIG. 57B

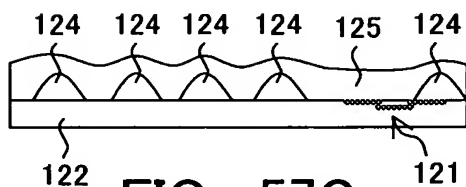


FIG. 57C

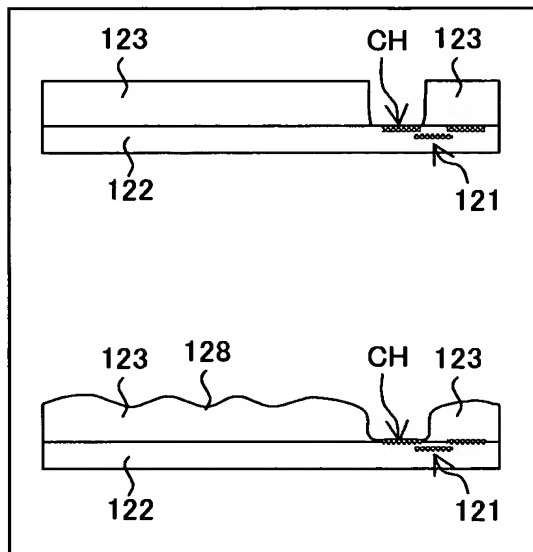


FIG. 57G

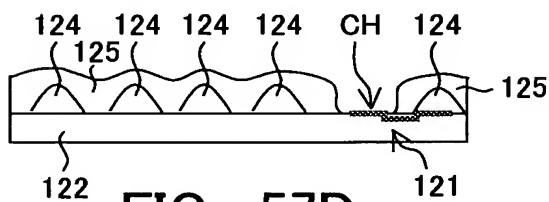


FIG. 57D

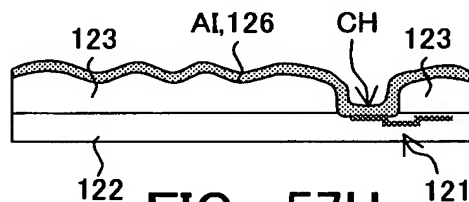


FIG. 57H

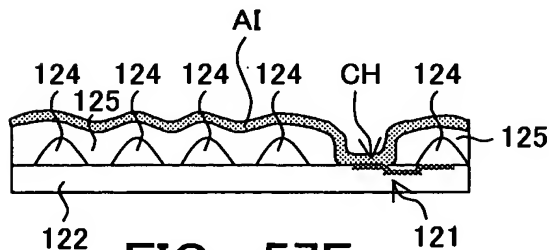
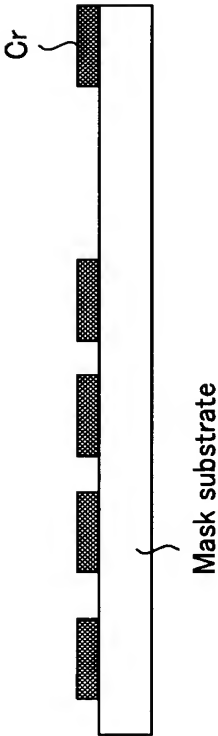


FIG. 57E

1st Exposure mask for half exposure



2nd Exposure mask for CH

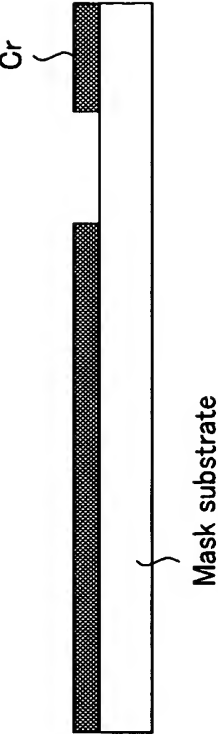
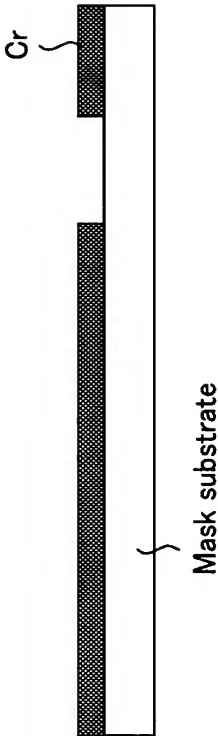
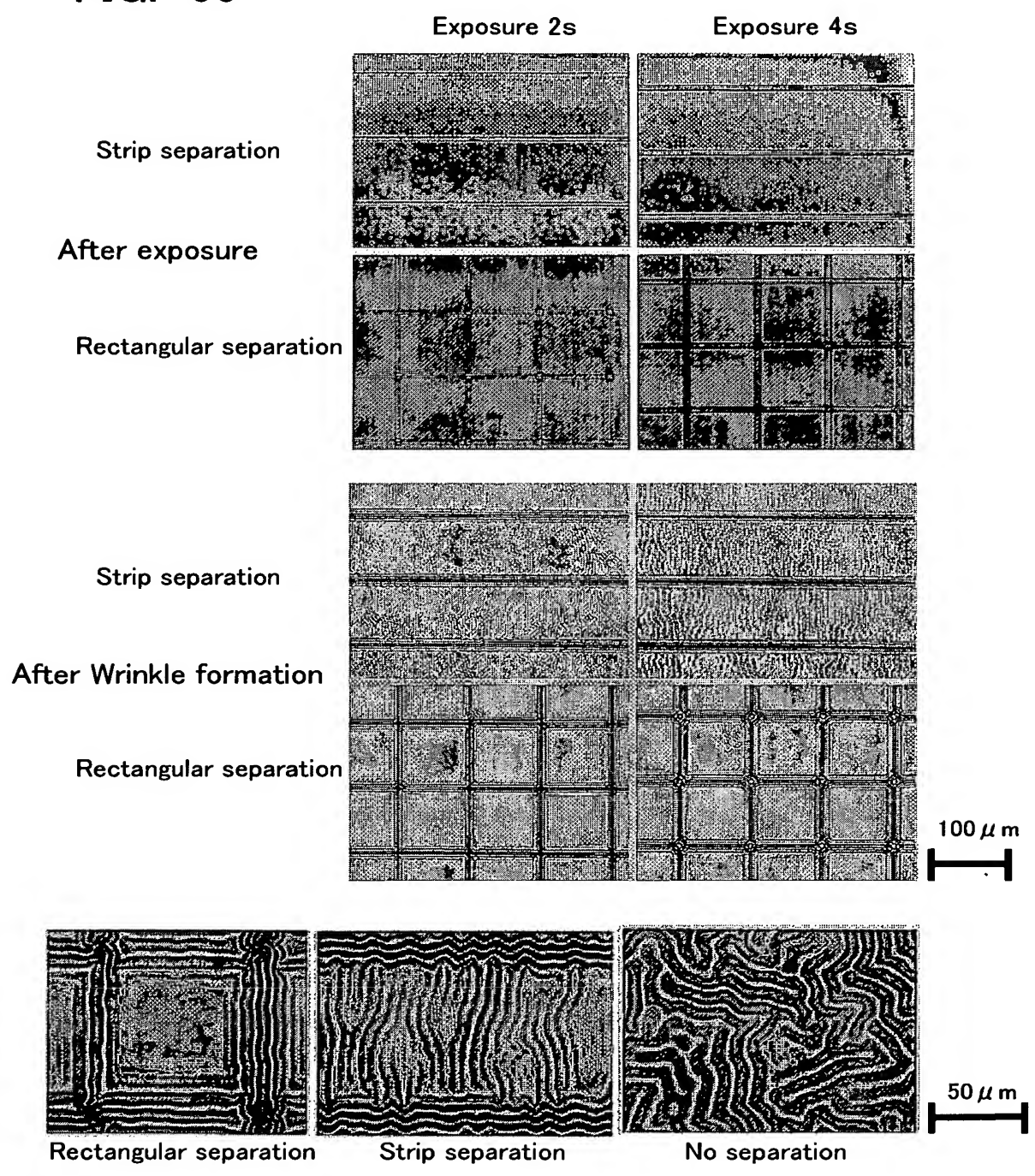


FIG. 58A

FIG. 58B

FIG. 59



208T0"604T500T

FIG. 60

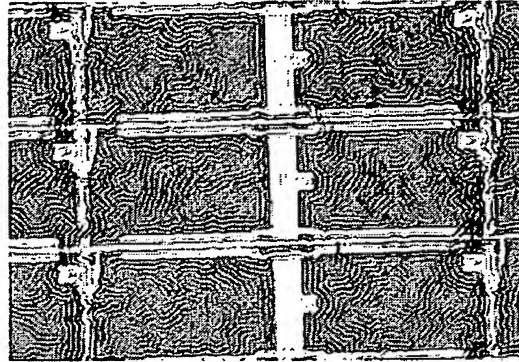
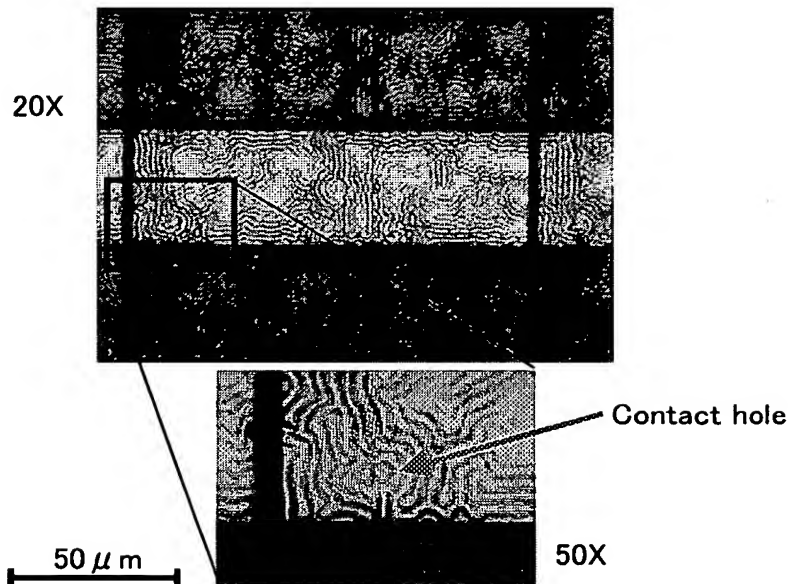


FIG. 61



208T10" 60ZFS00T

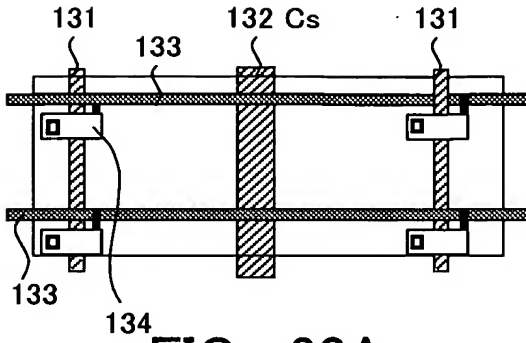


FIG. 62A

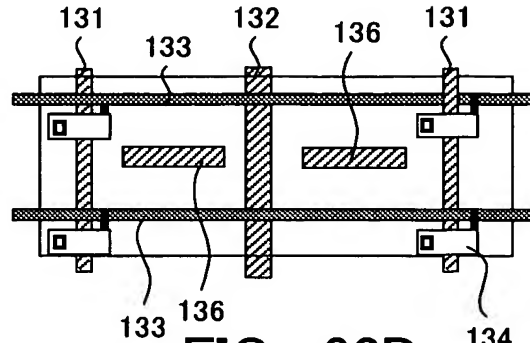


FIG. 62D

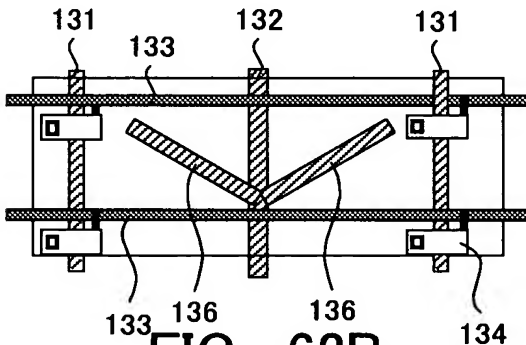


FIG. 62B

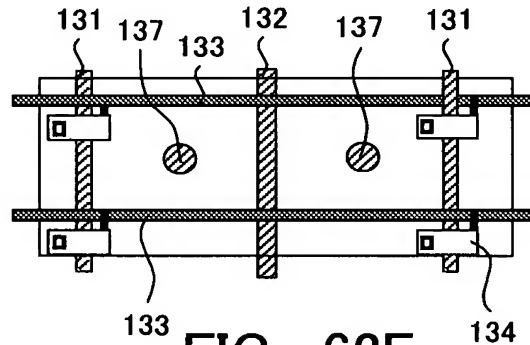


FIG. 62E

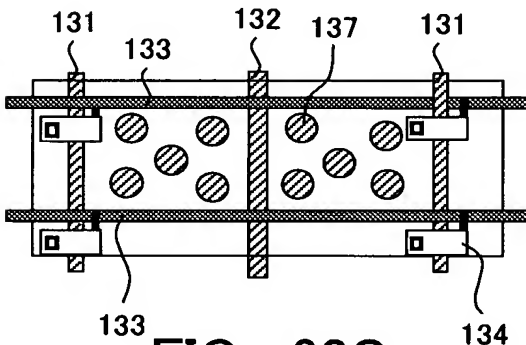


FIG. 62C

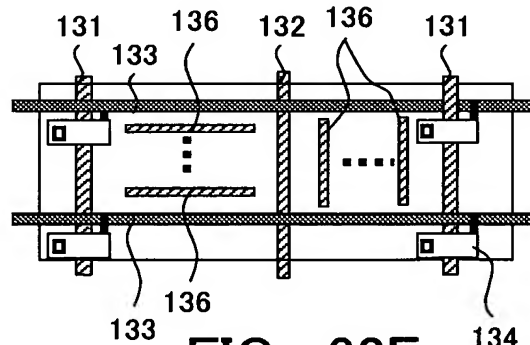


FIG. 62F

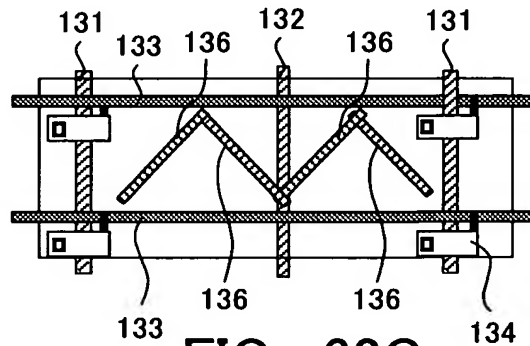


FIG. 62G

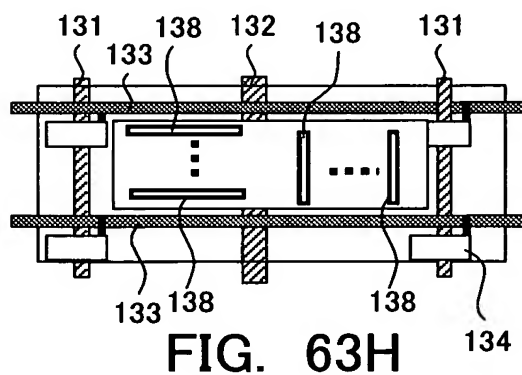
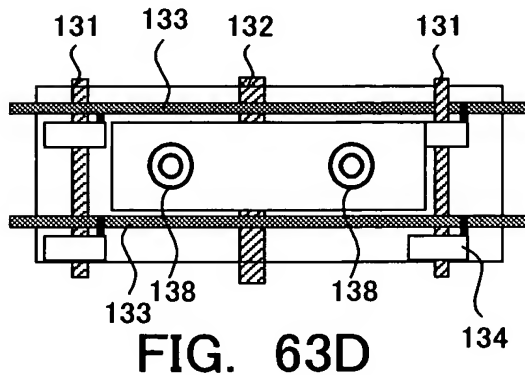
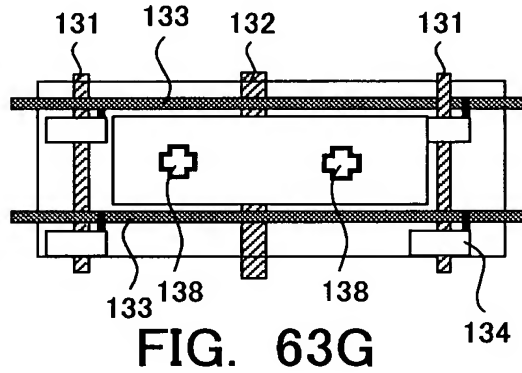
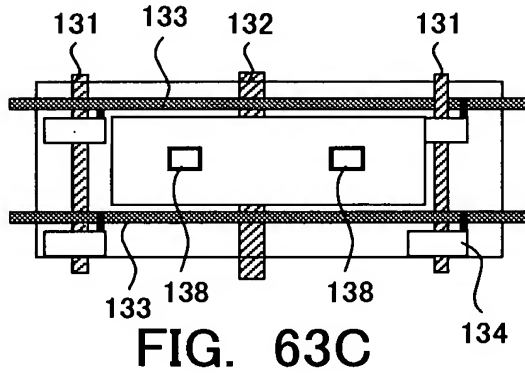
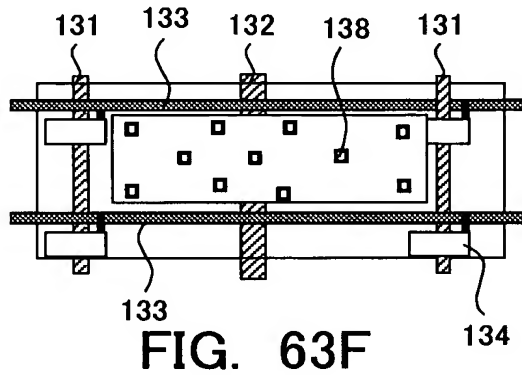
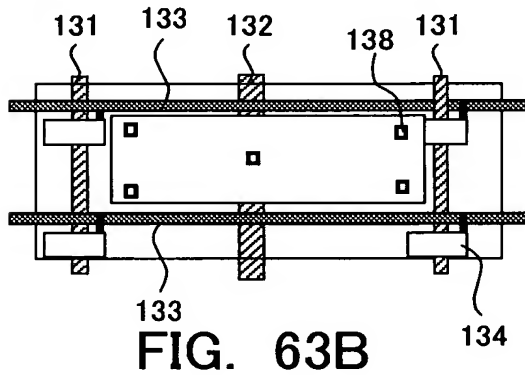
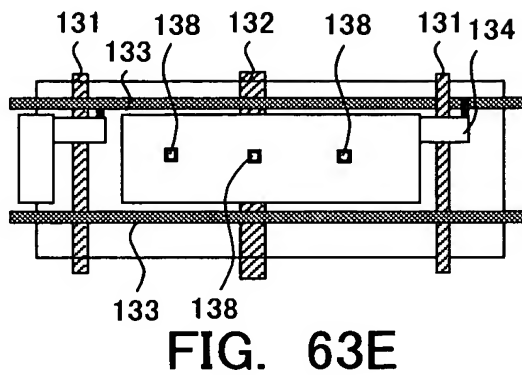
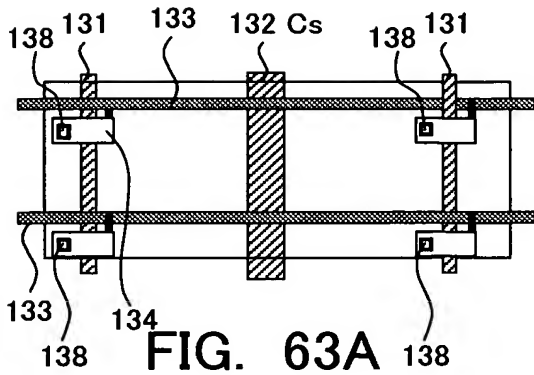


FIG. 64

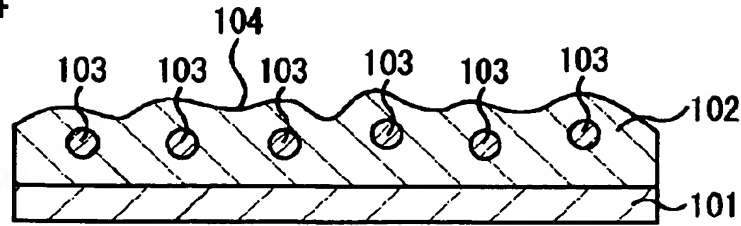


FIG. 65

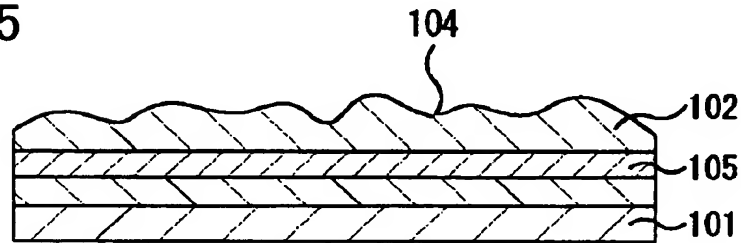


FIG. 66

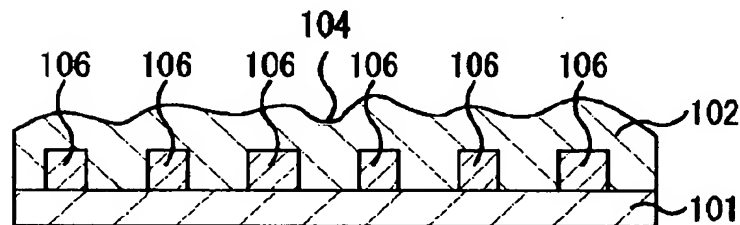
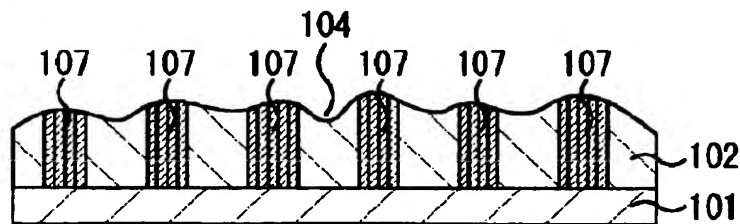


FIG. 67



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FIG. 68

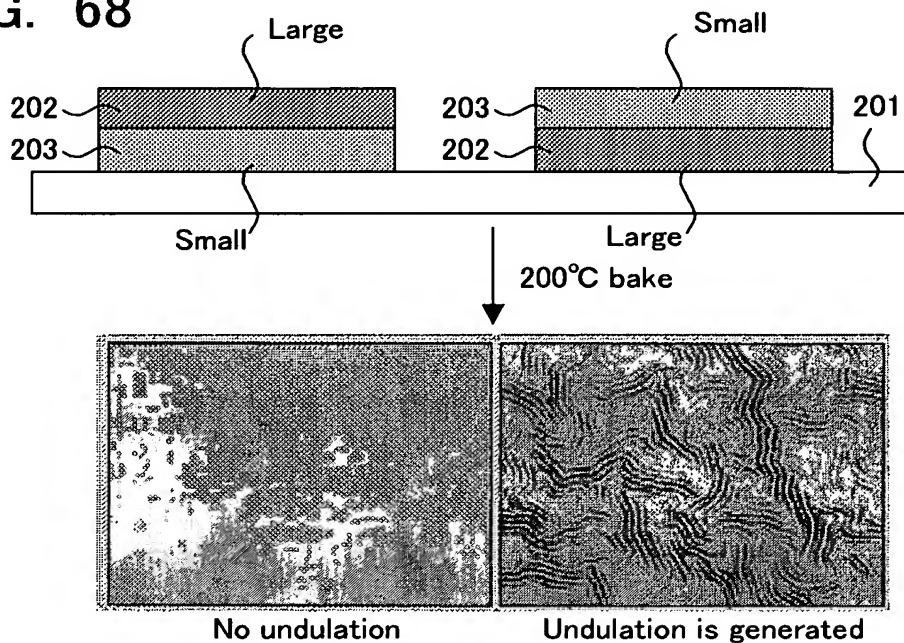


FIG. 69

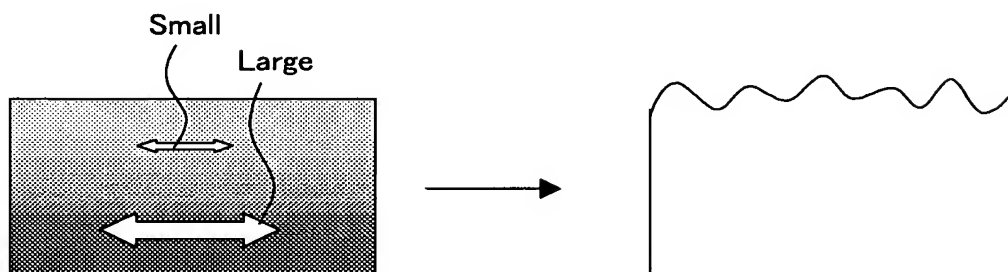


FIG. 70

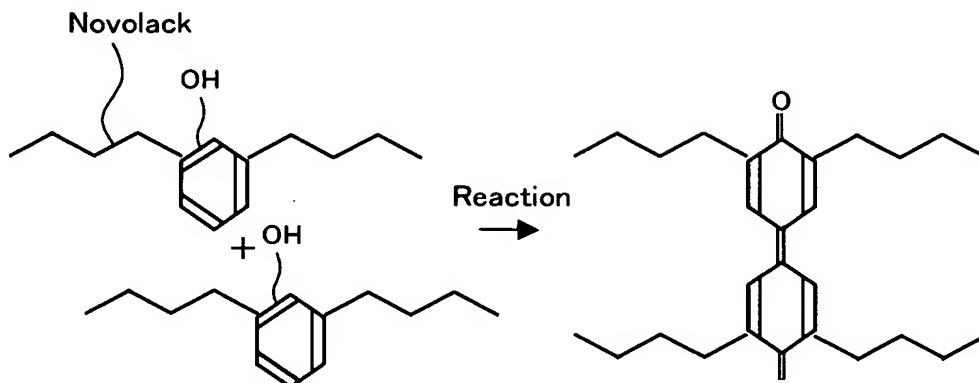
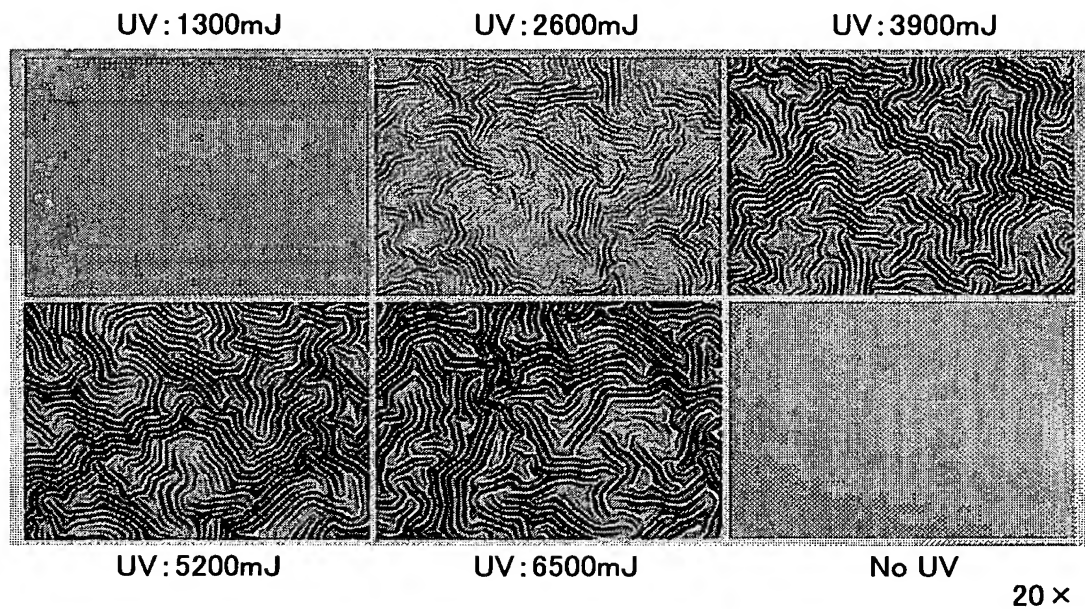




FIG. 71



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FIG. 72

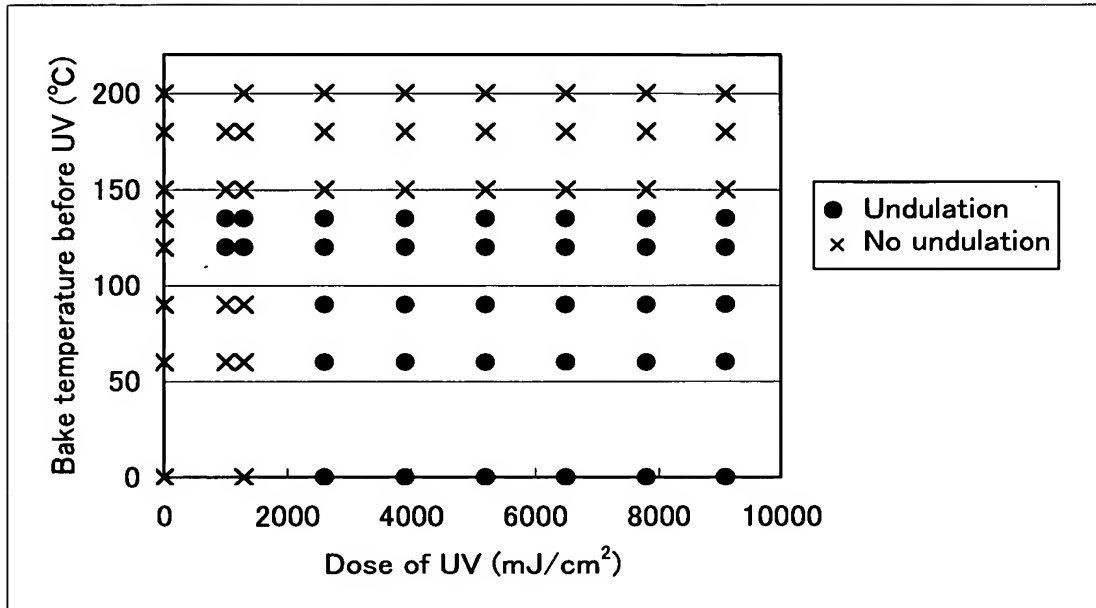


FIG. 73

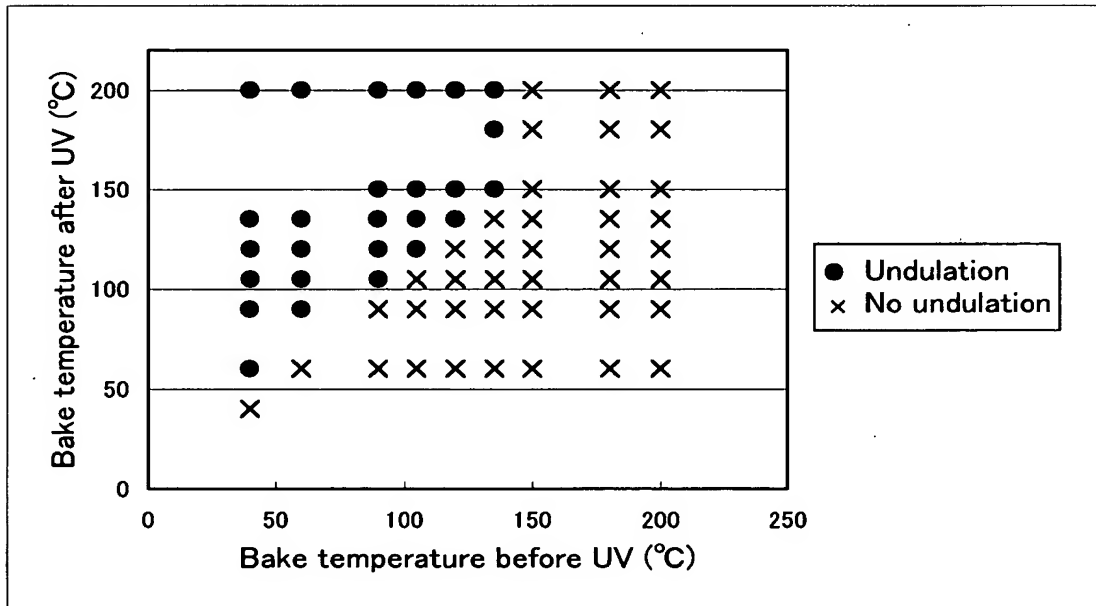


FIG. 74

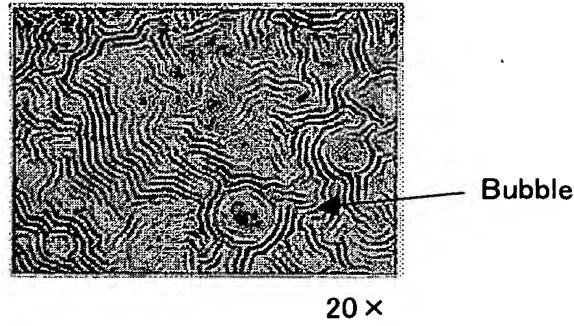
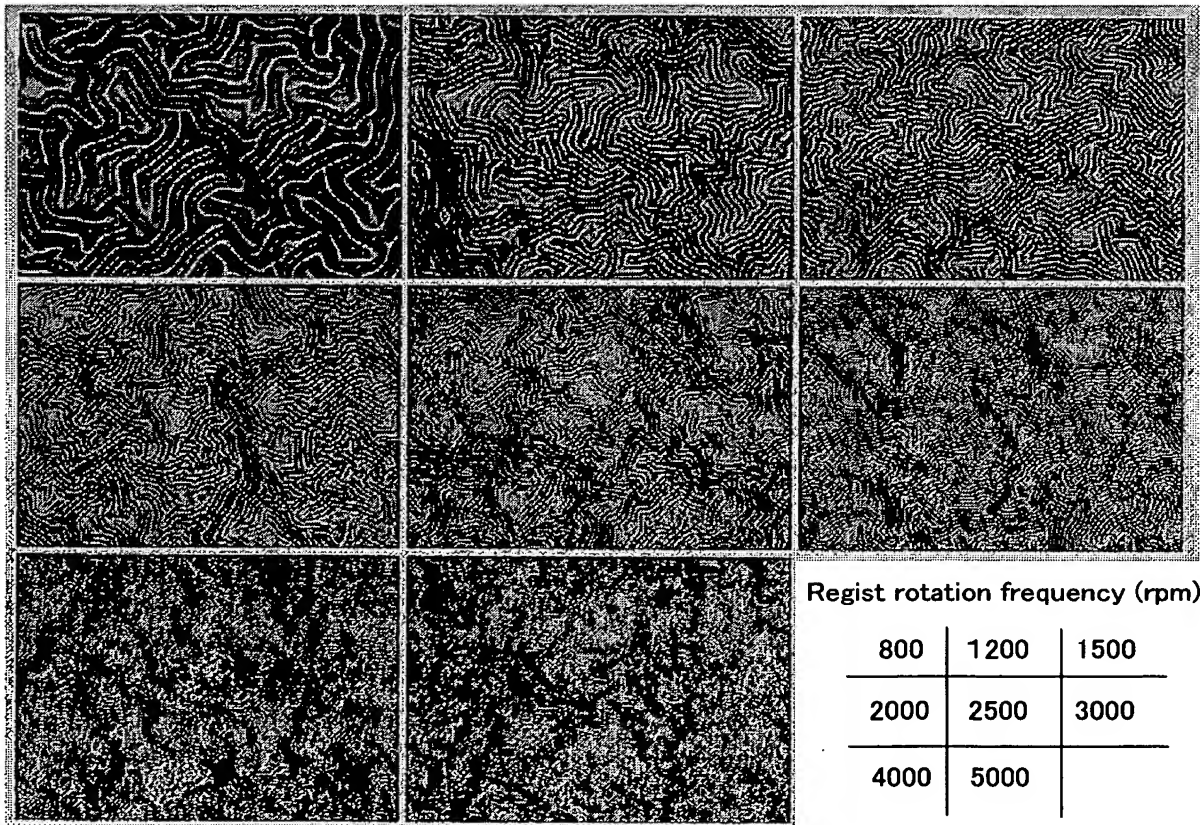


FIG. 75



20 ×

208770" 6047500T

FIG. 76

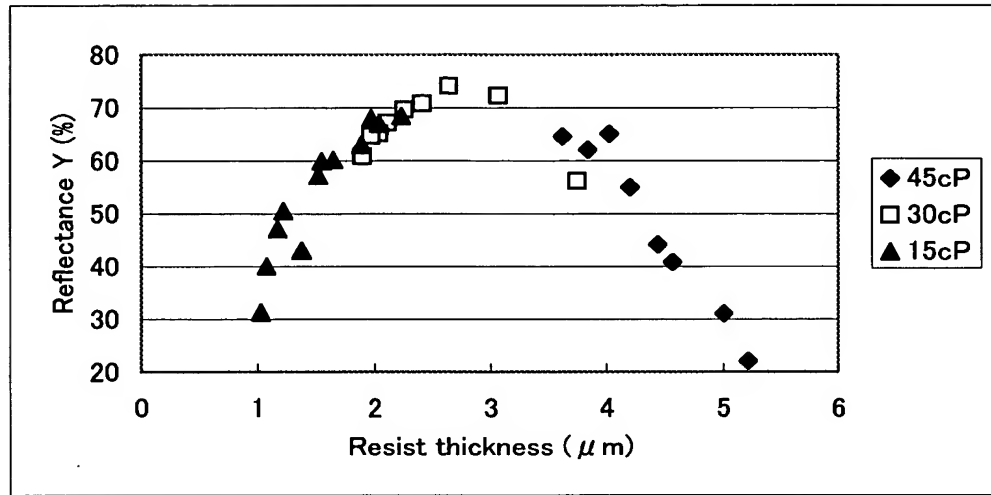


FIG. 77

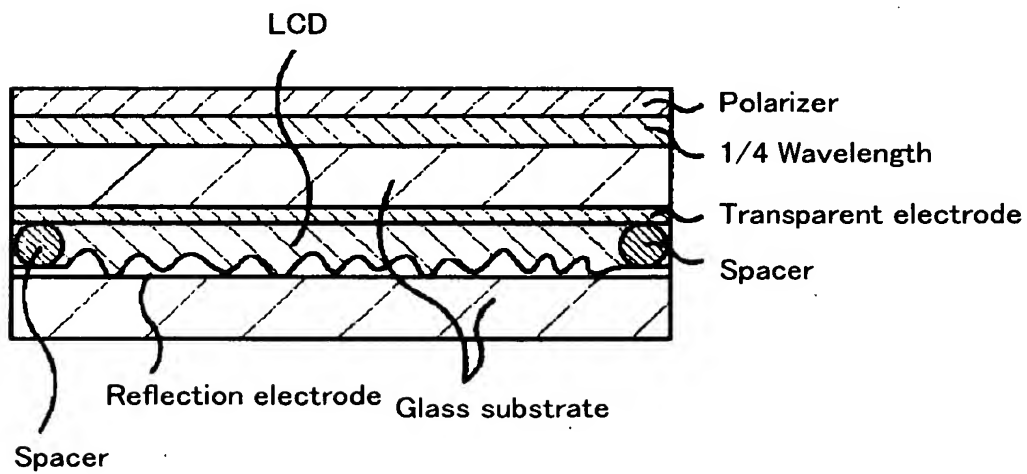


FIG. 78

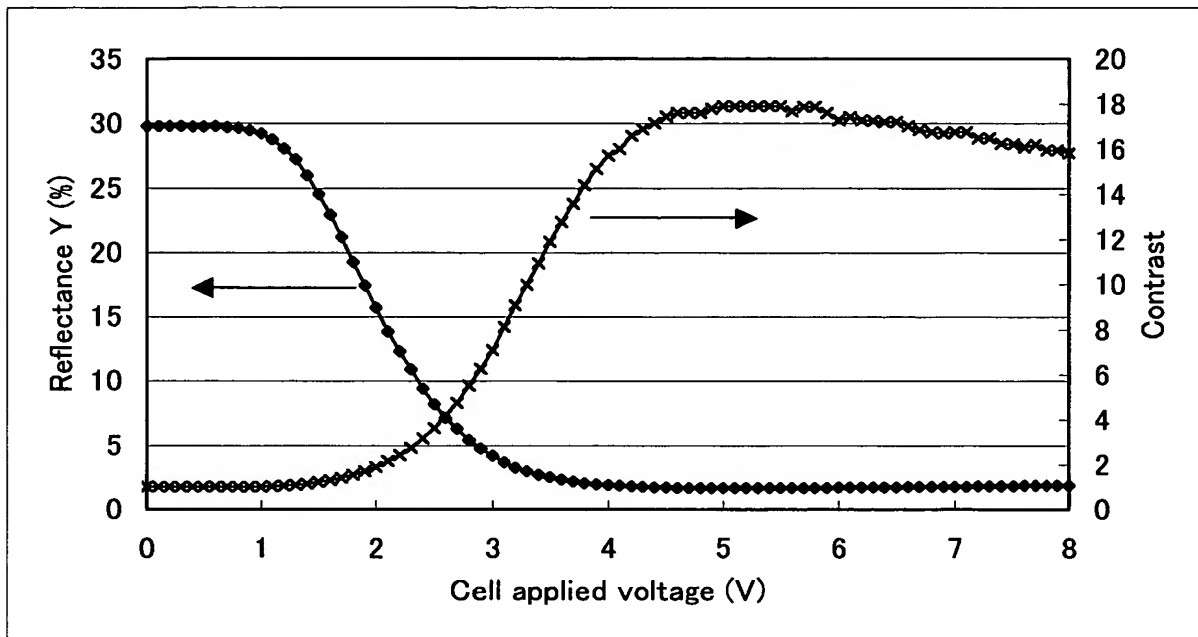


FIG. 79

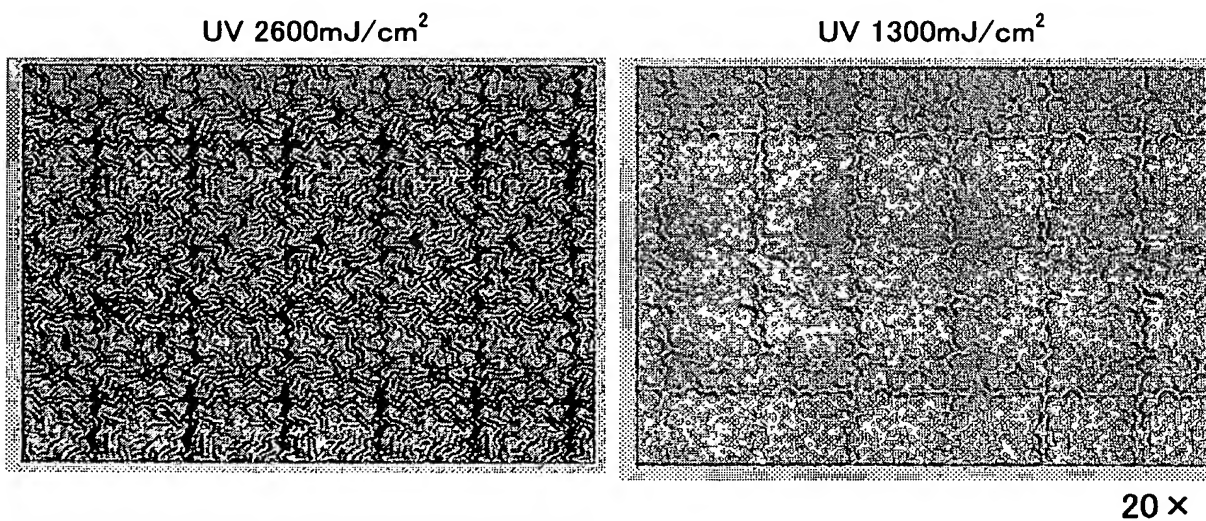
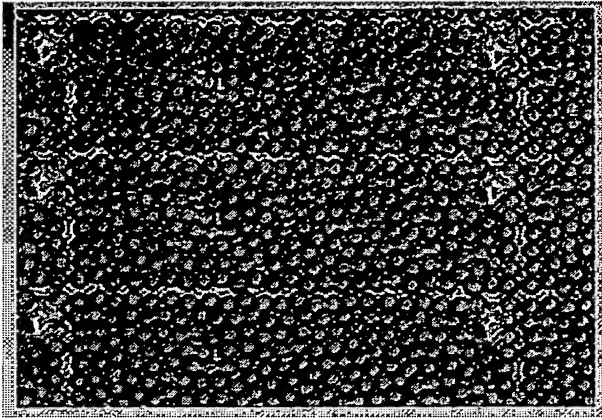
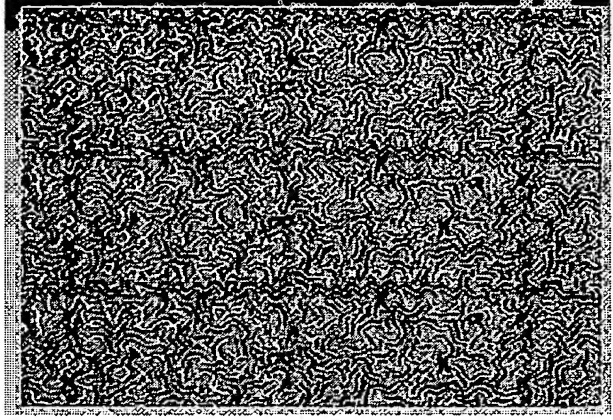


FIG. 80A



UV 80mJ/cm<sup>2</sup>

FIG. 80B



UV 35mJ/cm<sup>2</sup>

FIG. 81

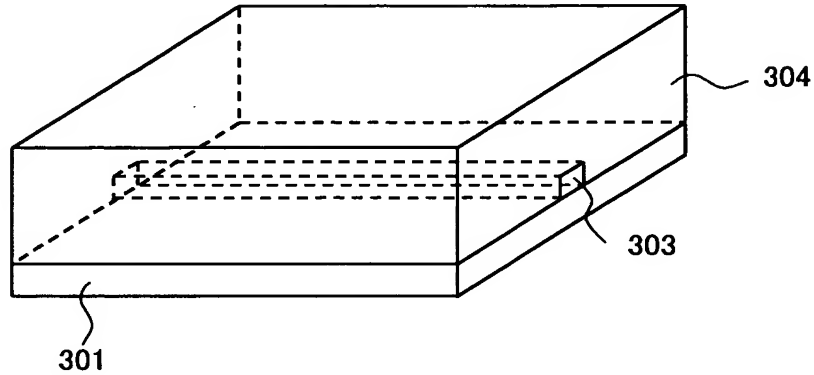
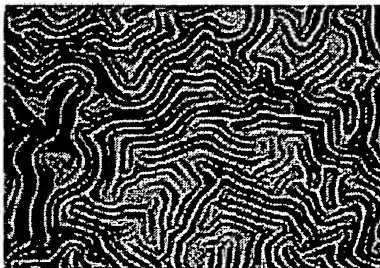
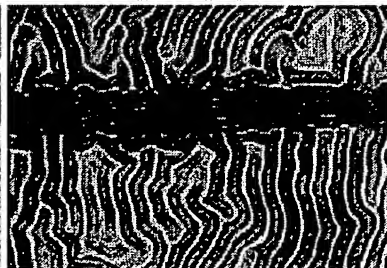


FIG. 82A



No undulation under resist

FIG. 82B



Undulation under resist

← Stripe undulation

20 ×

208710-607500T

FIG. 83A

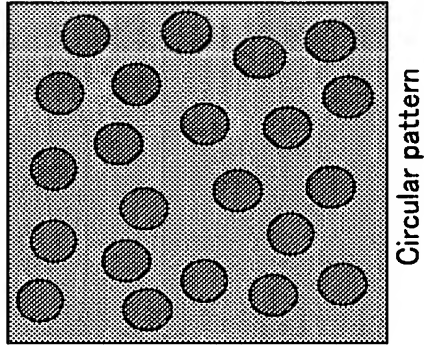


FIG. 83B

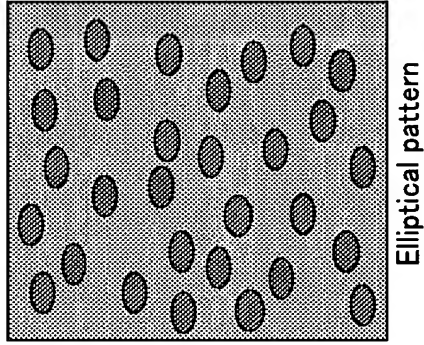


FIG. 83C

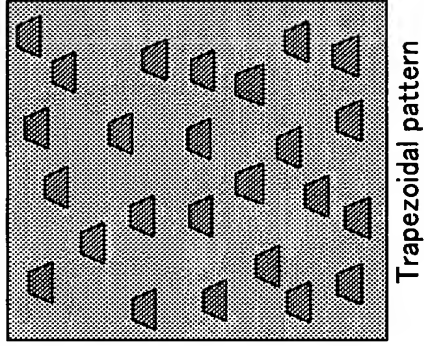


FIG. 83D

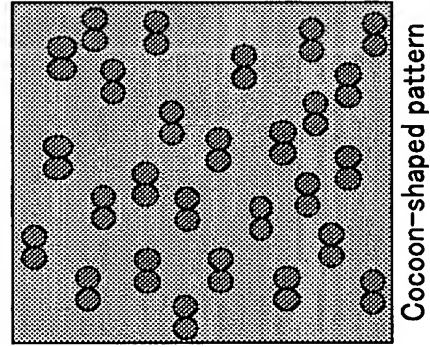


FIG. 83E

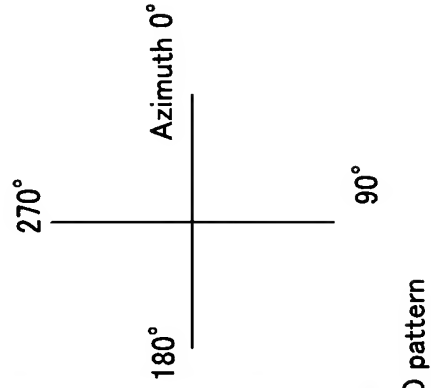
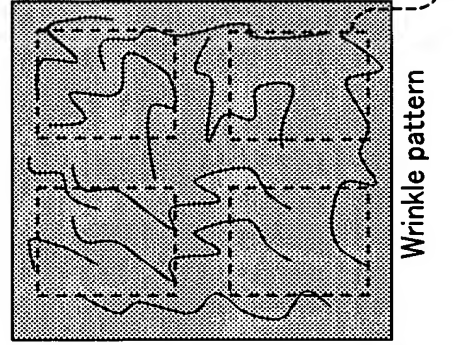
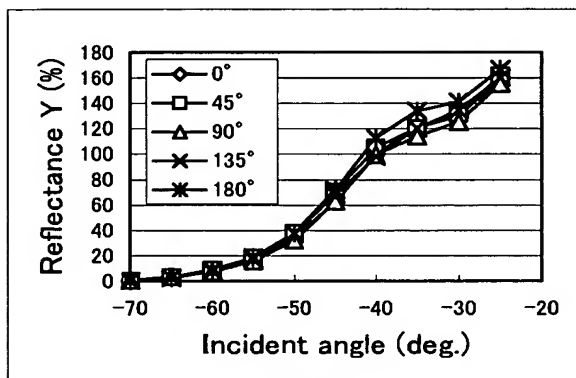
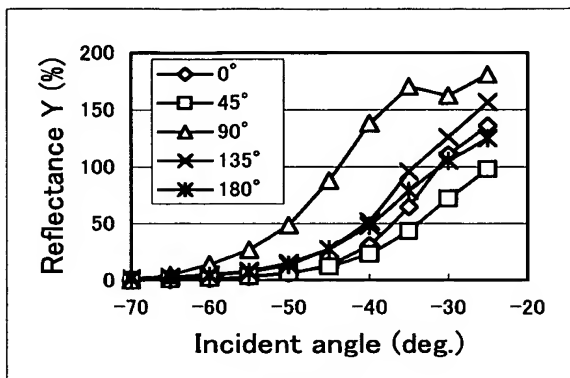


FIG. 84A



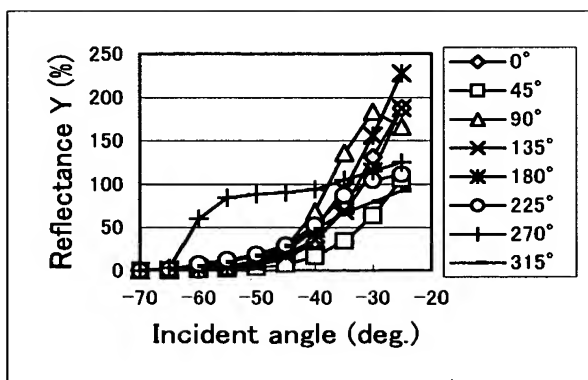
Circle

FIG. 84B



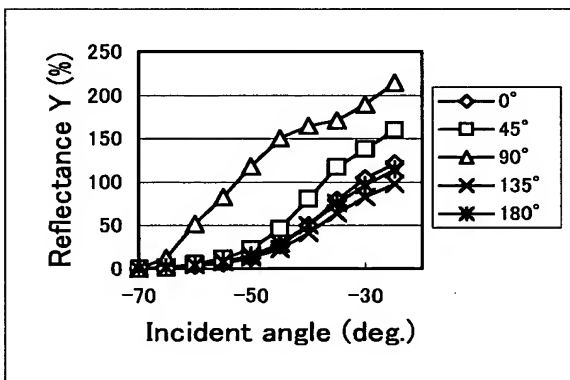
Elliptical

FIG. 84C



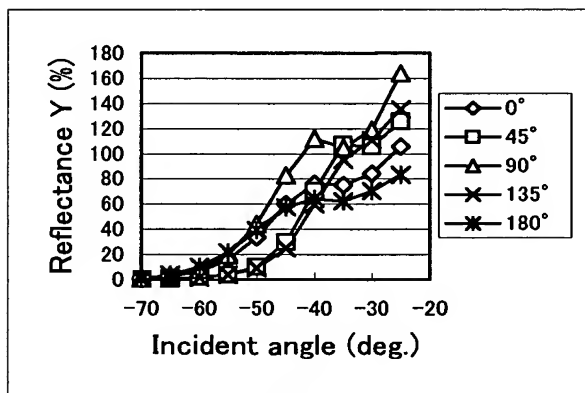
Trapezoidal

FIG. 84D



Cocoon-shape

FIG. 84E



Wrinkle

20250701 10:57:00



FIG. 85

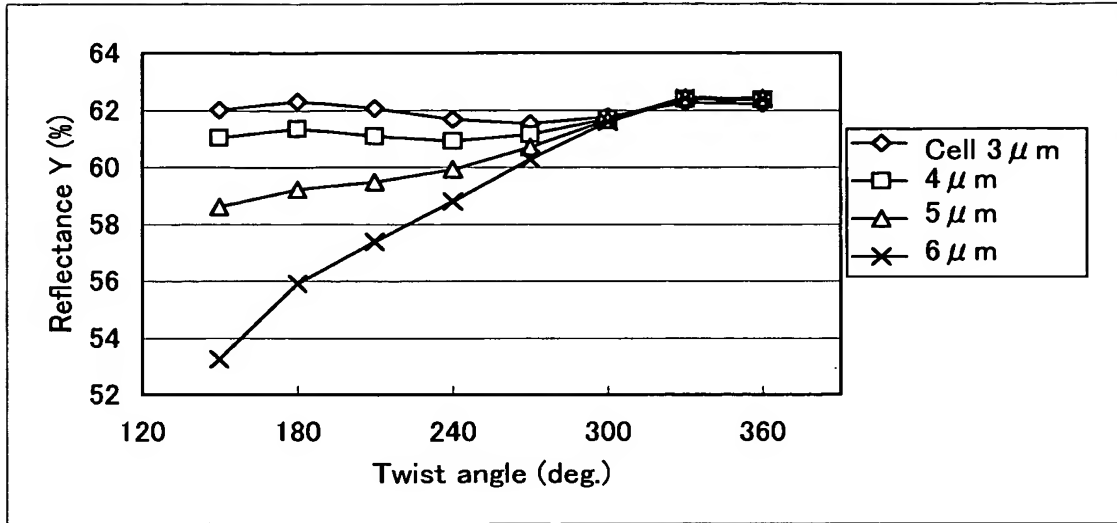


FIG. 86

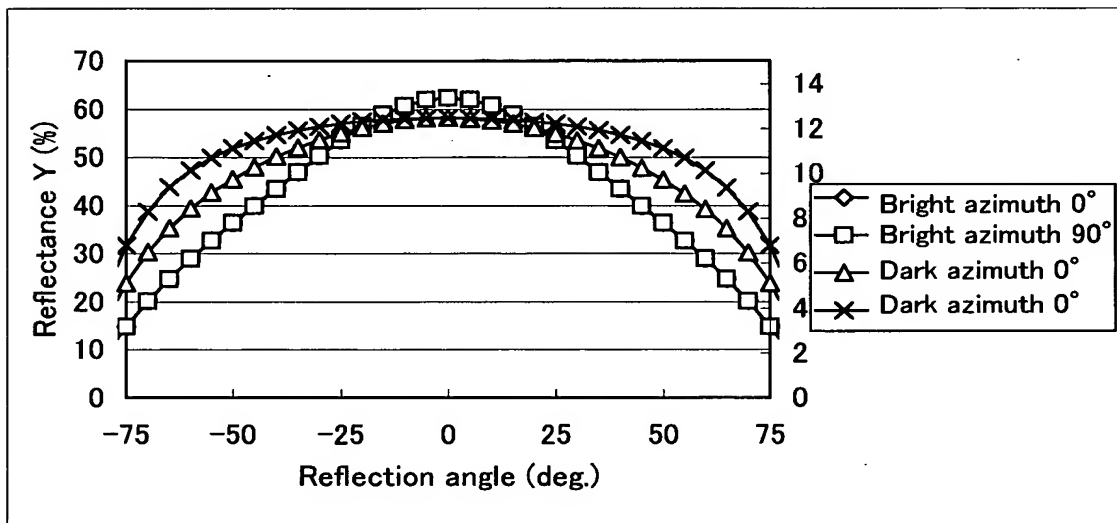


FIG. 87

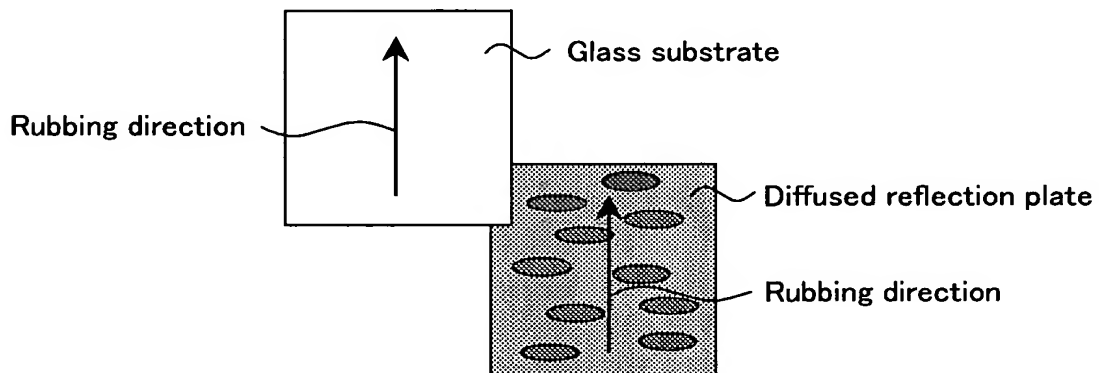


FIG. 88

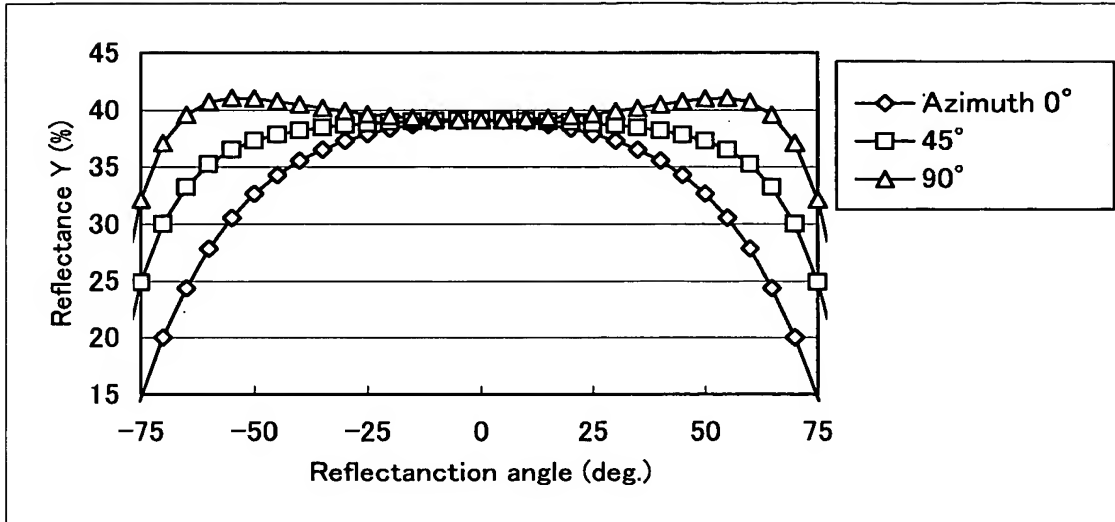


FIG. 89

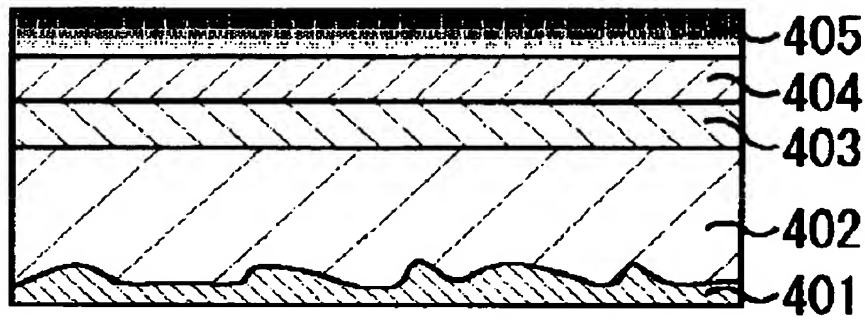


FIG. 90

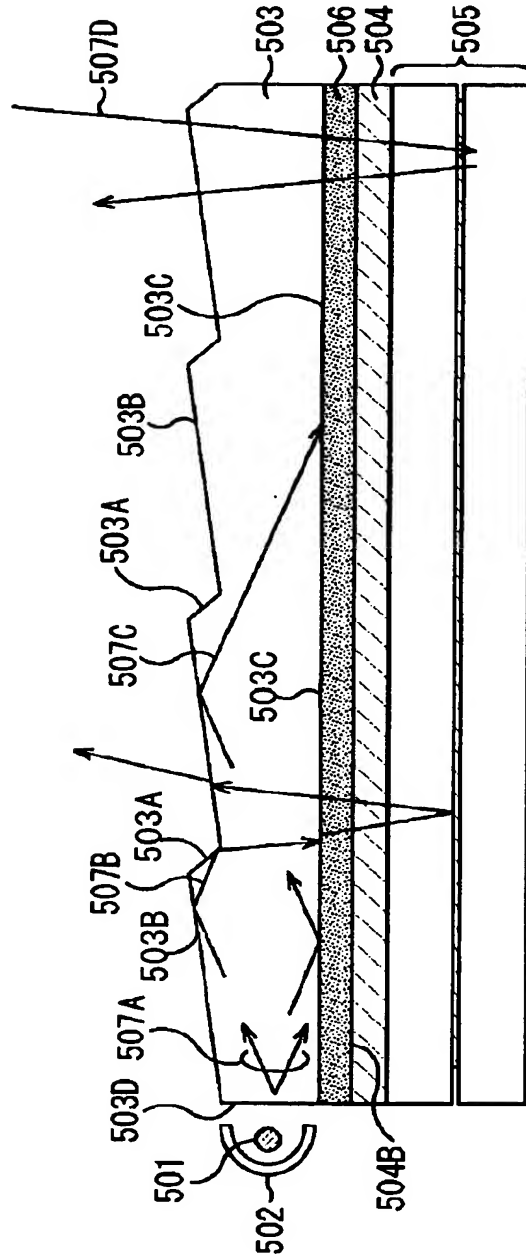
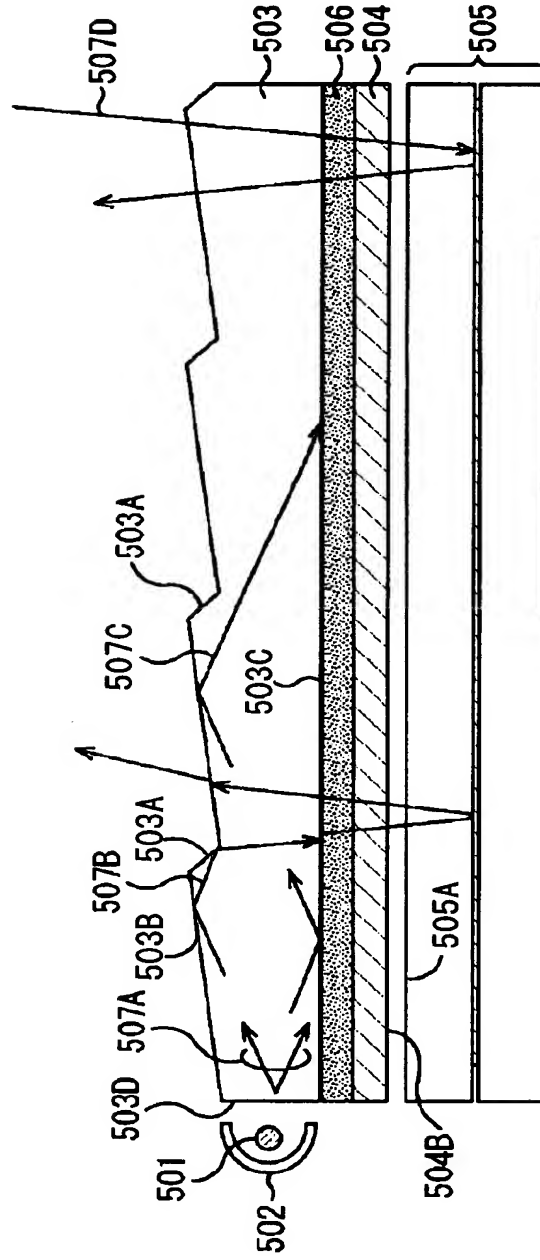


FIG. 91



1051709-011804

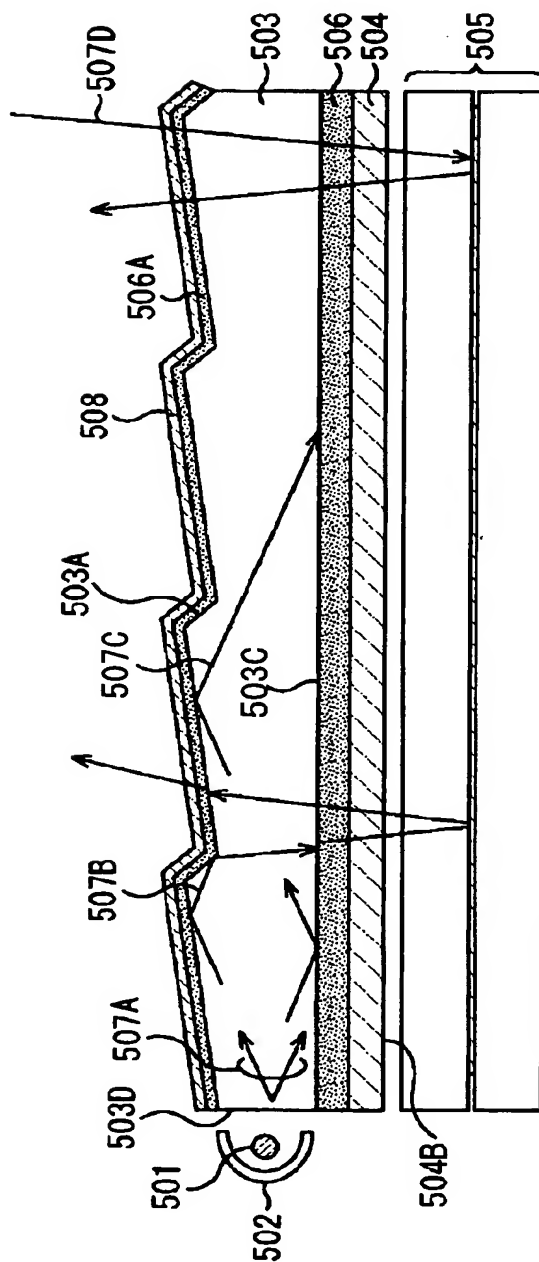


FIG. 93

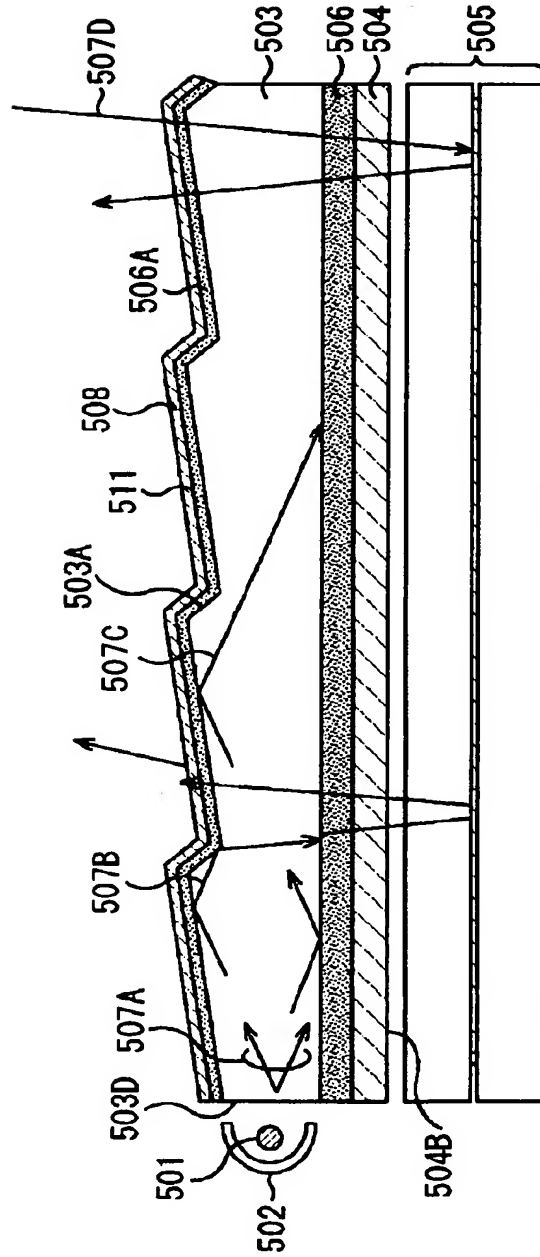
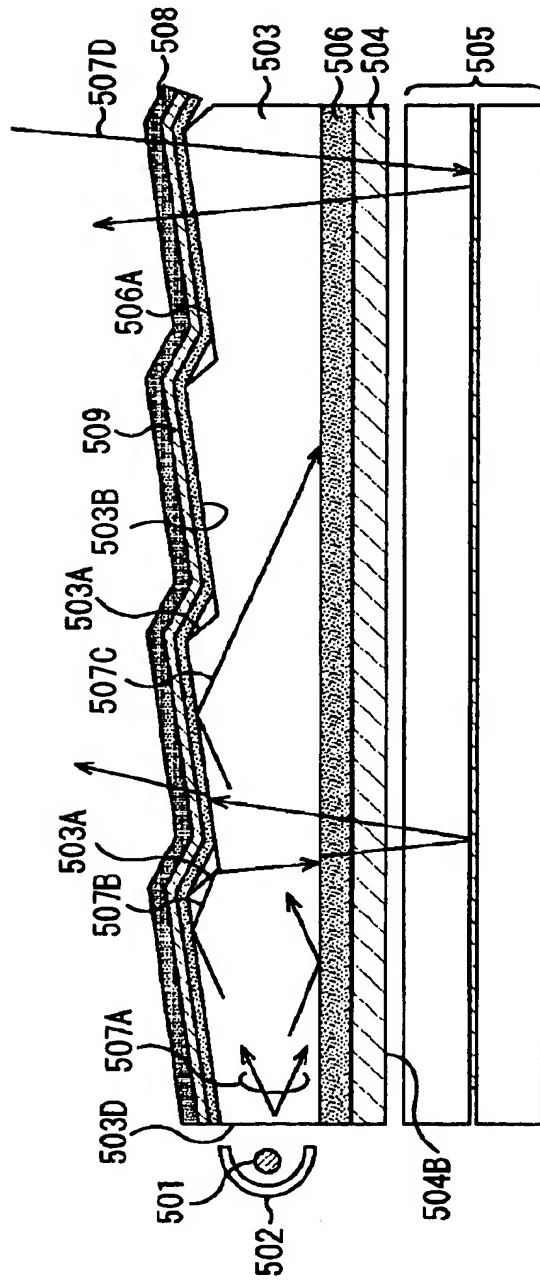


FIG. 94



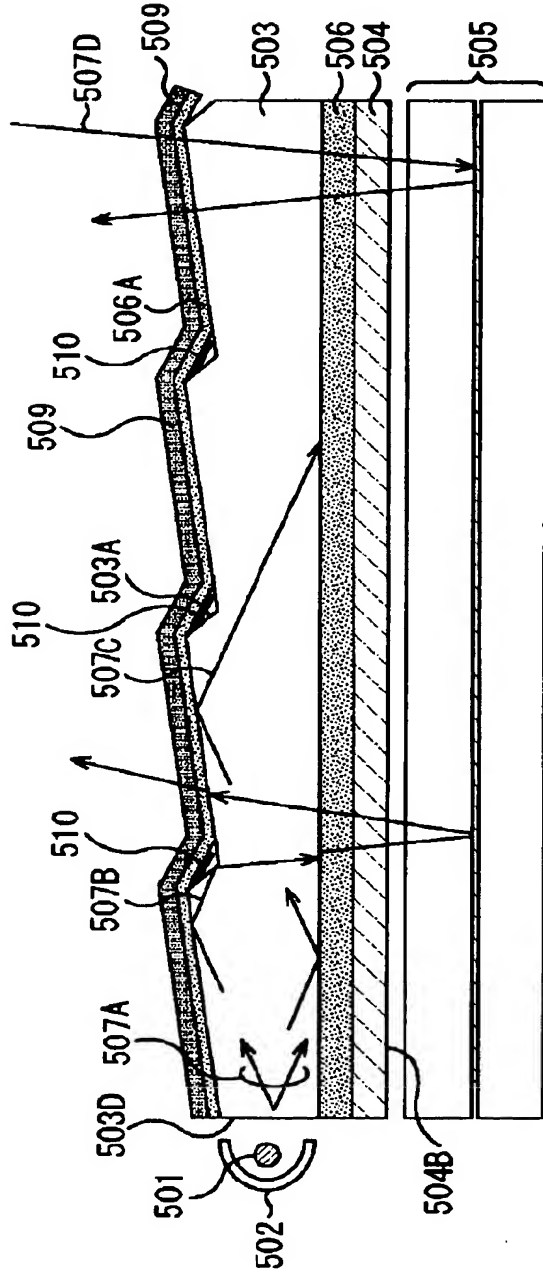


FIG. 95A

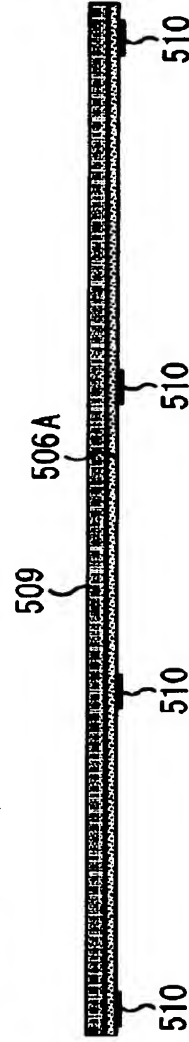
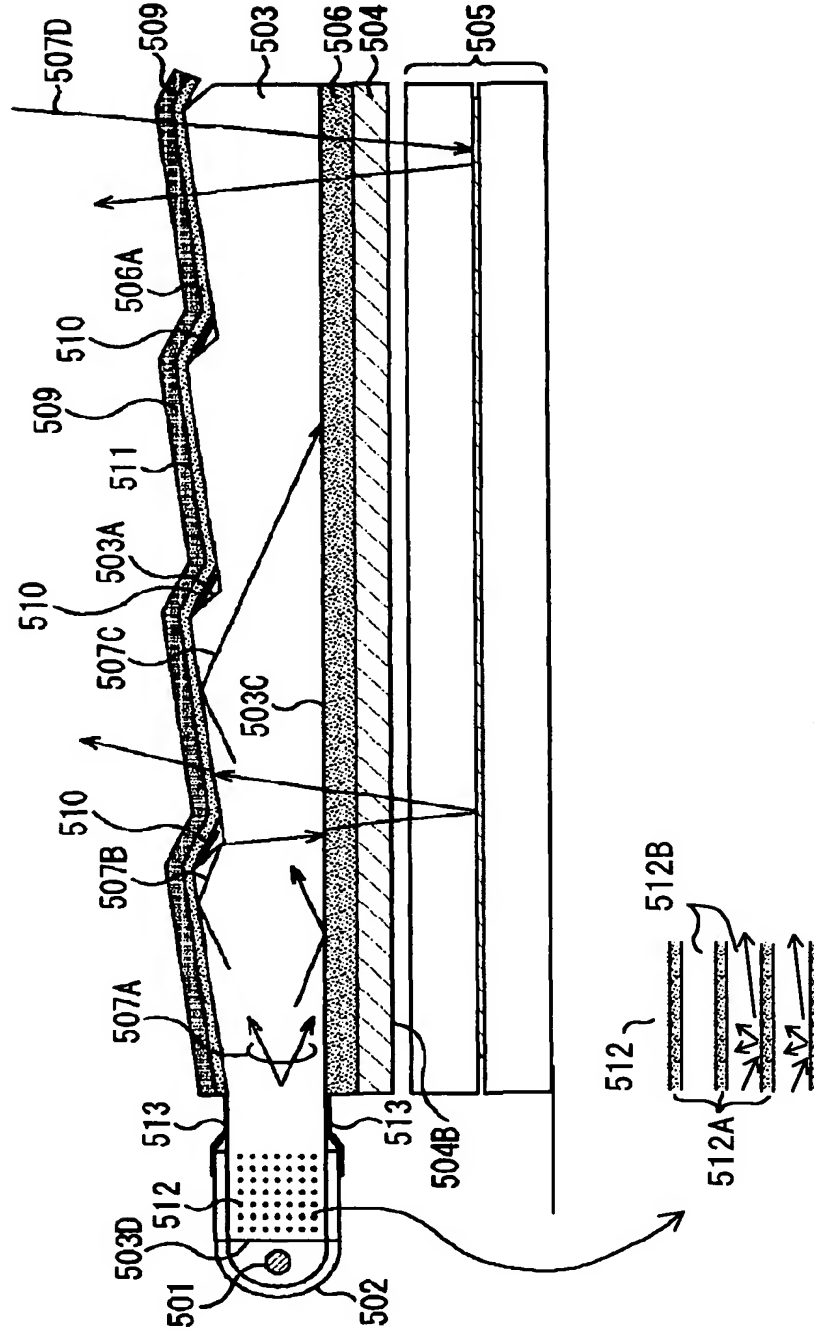


FIG. 95B



FIG. 96



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FIG. 97

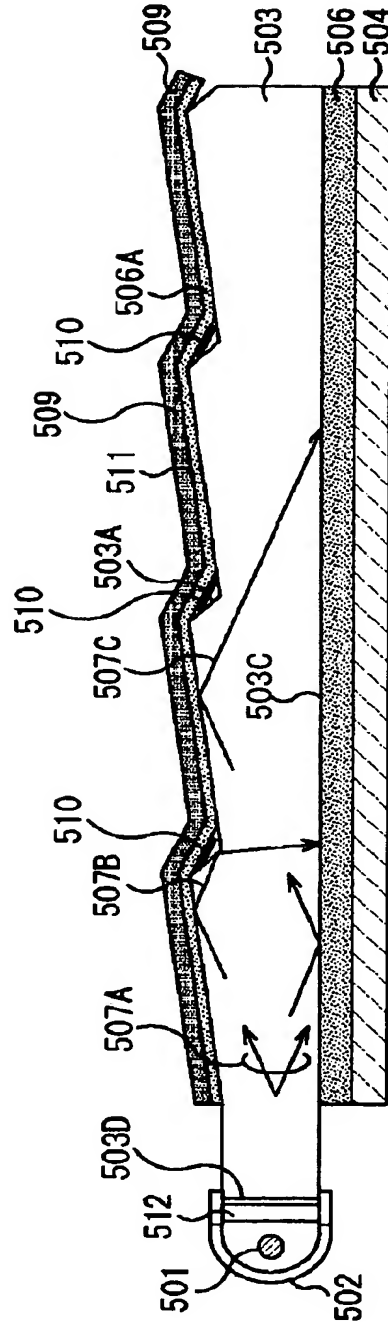
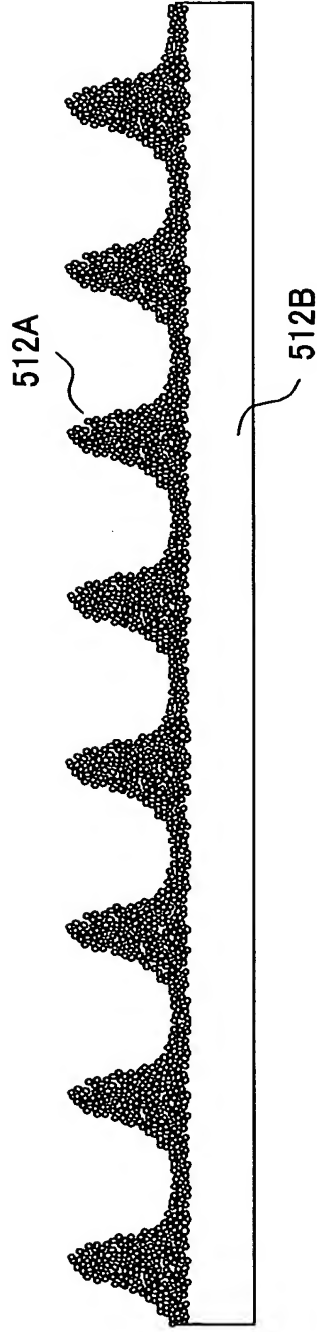


FIG. 98



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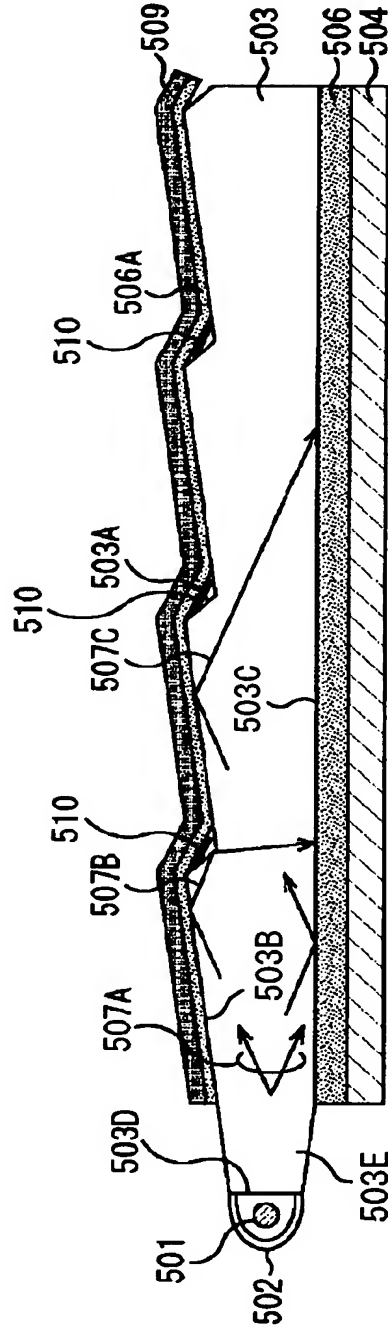


FIG. 100

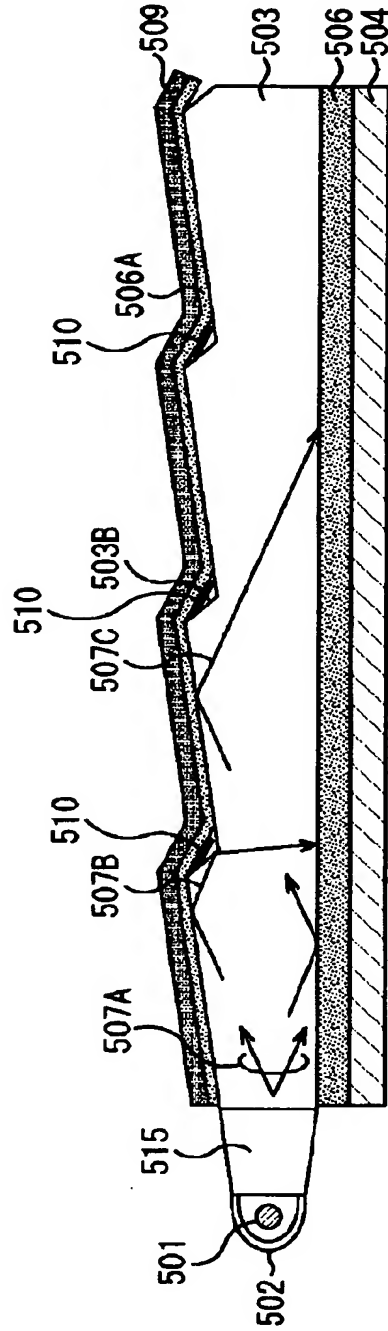
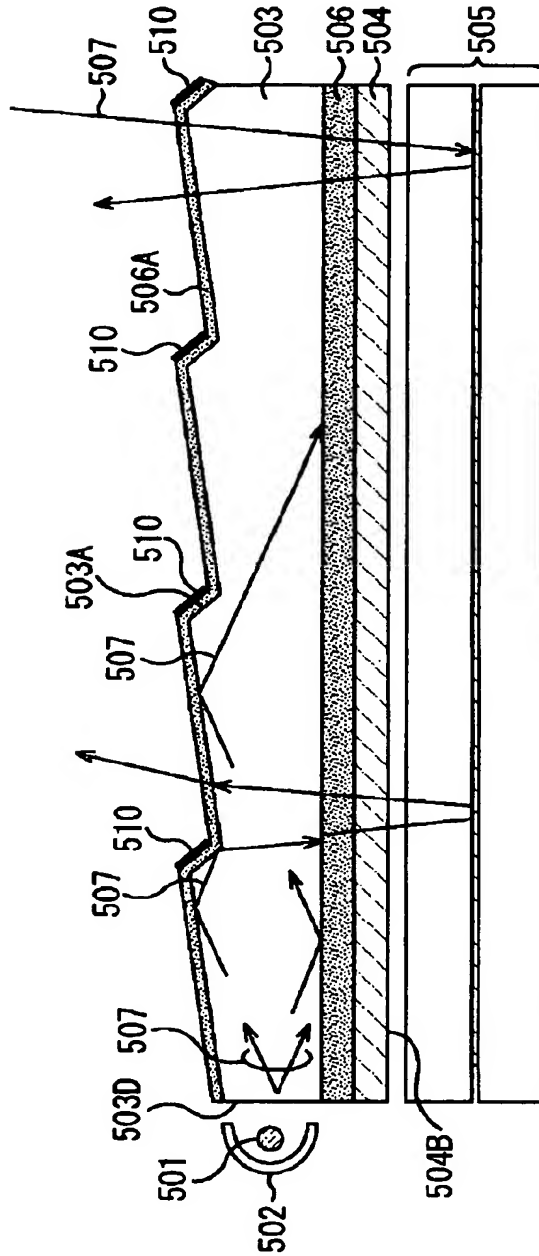


FIG. 101



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FIG. 102

